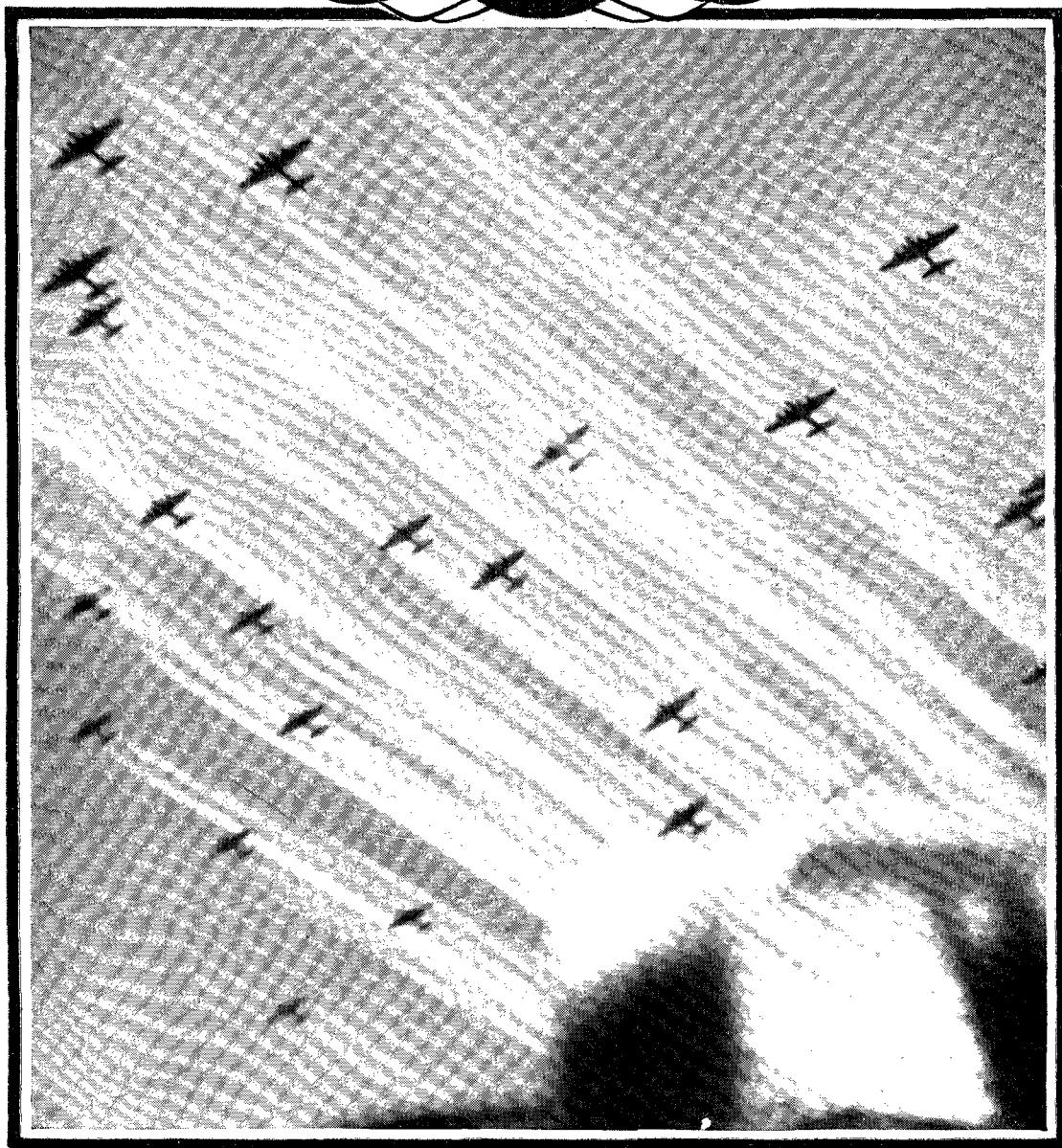


# AIR FORCE

THE OFFICIAL SERVICE JOURNAL

OF THE U. S. ARMY AIR FORCES



OCTOBER 1943

## October Brief

**ALLIED OCCUPATION** of Kiska Island on August 15 marked the fall of the last Jap foothold on American soil and set the stage for future aerial operations against the heart of the Japanese empire. The steady pounding of Jap-held bases by bombers and fighter-bombers of the 11th Air Force was one of the decisive factors in eliminating enemy forces in the Aleutians. A nine-page "On To Tokyo" section in this issue describes the highly efficient work of the 11th Air Force, the natural obstacles confronting its personnel and some sidelights on life in the Aleutians. The material in this section, which begins on Page 13, was written or compiled by Maj. Jo H. Chamberlin, Headquarters, Army Air Forces, who recently returned from the Aleutian theatre.

**WHEN A NAGA** headhunter in northern Burma speaks of a "double airplane which drops half — BOOM," he is referring to the P-40s of the 10th Air Force which pack 1,000-pound bombs in order to do a cleaner job on railroad bridges and similar targets in Jap-occupied Burma. The work of these "B"-40s is described on Page 5 in an article by Capt. Luther Davis of the 10th Air Force.

**COL. FRED M. DEAN**, former CO of a Spitfire group which took a prominent part in the Sicilian campaign, states that the Axis air opposition to our invasion forces in Sicily was nothing short of "feeble and futile." Colonel Dean, 26-year-old member of the West Point Class of '38, writes of the decline of the Luftwaffe in an article on Page 6. His group saw the caliber of German air power tail off, from its peak days over western France, in Tunisia, Pantelleria and, finally, Sicily.

**TWENTY-FIVE** combat missions in three theatres, bombing raids on land targets and

submarines and scraps with enemy fighters without a crew member being scratched or an enemy bullet once piercing the skin of their bomber—that is the combat record of the "Dream Crew" described on Page 8. Moreover, the B-24 of the story had the fewest turn backs for mechanical reasons of any ship in her group. The account of this remarkable plane and crew was written by Capt. Arthur Gordon of the 8th Air Force.

**EARLY THIS SUMMER**, William Howard Stovall, Jr., was accepted for pilot training.

When he received a letter of congratulations from his father, Col. William H. Stovall of the 8th Fighter Command in England, he turned the pages on some of the soundest advice ever offered an aviation cadet. Colonel Stovall, who was credited with destroying eight German planes during the first World War, showed the letter to Brig. Gen. Frank O'D. Hunter before posting it to his son. General Hunter added a note and, in turn, passed the letter along to several other officers in the command, each of whom addressed a memo to young Stovall. In the

belief that the contents make worthwhile reading for all AAF personnel, AIR FORCE has received permission to publish the letter and the enclosures. They appear on Page 10.

**TEACHING** aircraft recognition to ground observers in the Aircraft Warning Service is resulting in a fifty percent decrease in calls to over-taxed filter centers. How the ground observers are "taking to" their recognition training is described in the article on Page 37.

**How** is your AIR FORCE Quiz score? Are the questions too tough? Too easy? Do you have any questions you would like to see included? Try a hand at this month's quiz on Page 39 and let us know what you think of it.

### The Front Cover

This month's cover photo shows a sky full of vapor-trailing B-17s approximately 25,000 feet over occupied France, en-route to bomb Nantes. The picture was snapped with an inexpensive box camera (No. 620 film) by Staff Sgt. Douglas C. Glover from the radio operator's gun position in one of the bombers on the mission. The object in the foreground is the top of an ammunition can. Staff Sgt. Ray W. Armstrong, ball turret gunner, brought the picture along when he returned home recently to have a try at pilot training.

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# CROSS COUNTRY

## The growing use of Automatic Flight Control Equipment, and other developments within the Army Air Forces.

**T**HE growing use of Automatic Flight Control Equipment, through which the bombardier actually operates the plane on the bombing run, is helping to make our precision bombing more precise.

The equipment itself is far from new, but early in the war modifications of our bombardment aircraft were occurring rapidly, and operational difficulties with AFCE were apparent. Experimentation continued in this field and gradually, through the cooperation of experienced bombardment officers and manufacturing specialists, the major difficulties were overcome.

Finally, seven teams of pilots and bombardiers were sent by Headquarters to the various fronts — England, Africa, India, China and the Pacific — to acquaint bomber crews with the improved equipment and test it under battle conditions.

The results of these tests have come in; AFCE has proved itself. On many fronts every bomber formation going over a target is being flown by AFCE.

Along with this development have come new methods of computing drift, dropping angle and length of run, plus new methods of using the computer to obtain figures quickly for any given heading.

One outcome of this combined refinement of our bombardment technique has cut down the vulnerability of our planes to enemy anti-aircraft fire. The effectiveness of such fire is directly related to the time consumed in the bombing run. The time now needed for a run is so brief that it would have been unbelievable a year ago. Single aircraft have made approaches with runs of only eight seconds. Formations take longer, of course, but their elapsed time also has been drastically cut.

But the greatest contribution of the AFCE principle is improved accuracy. It has been found that application of the

principle reduces the mean error, even of experts, by fifty percent. To illustrate: if the mean error is cut from 1,000 to 500 feet, the result is to *quadruple* the effect of the bombing.

It means that nine planes can do the work of thirty-six; return trips over the target are cut to a minimum; fewer lives are risked; less effort is expended; less equipment is needed to accomplish a mission.

### REPRINTS OF THE BACK COVER

Shortly before this issue of *AIR FORCE* went to press, an officer of one of the AAF commands was visiting the office when he noticed a proof of the back cover, which depicts the "Salute Proudly" theme. He immediately requested a number of reprints for posting throughout his organization.

As a result, a limited quantity of back cover reprints have been made available for general distribution upon request to the Service Division, AIR FORCE Editorial Office, 101 Park Avenue, New York 17, N. Y. Requests will be filled on a first-come-first-served basis, so respond early if you're interested.

### PERSONNEL REDISTRIBUTION CENTER

Officer and enlisted personnel returning to the States, except those returned for hospitalization or specific assignment, will be reassigned through the Personnel Redistribution Center established several weeks ago. Those discharged for

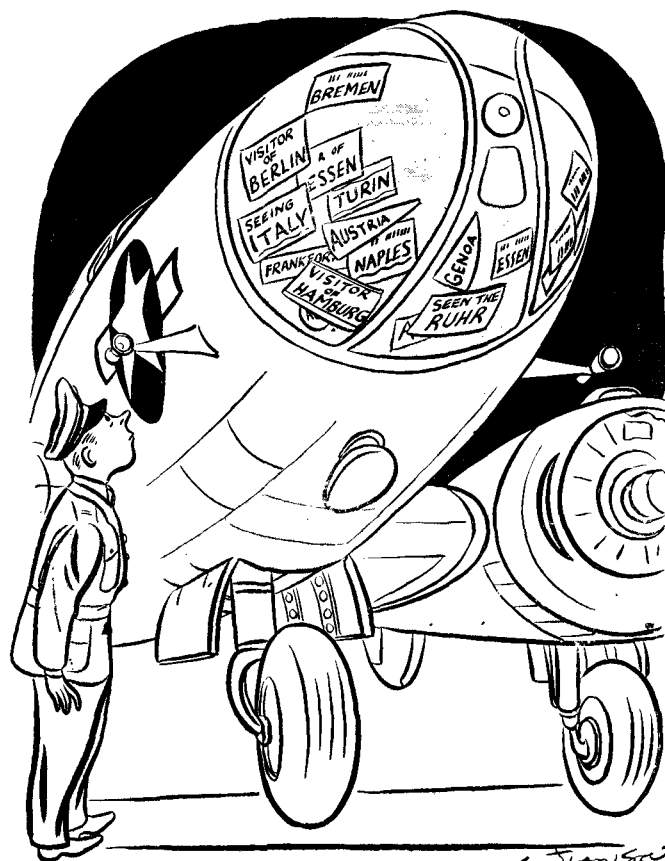
medical reasons will be assisted in their return to civil life through various government agencies.

Redistribution stations have been set up at Atlantic City, N. J., and Miami Beach, Fla. A third station will be established later. Rest camps for AAF personnel will be operated at Lake Lure, N. C., Camp Mystic, Tex., and Castle Hot Springs, Ariz.

The Personnel Redistribution Center is under the direct supervision of the Assistant Chief of Air Staff, Personnel, at Headquarters, Army Air Forces.

### GENERAL STRATEMEYER'S NEW POST

Maj. Gen. George E. Stratemeyer has been named commanding general of the Army Air Forces in India and Burma and advisor to the commanding general of



U. S. Army Forces in the India-Burma-China theatre. General Stratemeyer's present duty followed service as Chief of the Air Staff at Headquarters. The new commanding general of the 10th Air Force is Brig. Gen. Howard C. Davidson, succeeding Maj. Gen. Clayton L. Bissell, whose new assignment had not been announced at press time.

### NEW CHIEF OF THE AIR STAFF

The new Chief of the Air Staff is Maj. Gen. Barney M. Giles, who was Assistant Chief of Air Staff, Operations, Commitments and Requirements, prior to this assignment.

General Giles, who rose from the grade of private, served with the 168th Observation Squadron in World War I, and was one of our first four-engine pilots. He is a former commanding general of the 4th Air Service Command, 4th Bomber Command and 4th Air Force.

Serving under General Giles as a new Deputy Chief of the Air Staff is Brig. Gen. Edwin S. Perrin, who succeeds Maj. Gen. Thomas J. Hanley. General Perrin has served as military air observer in the Middle East, and prior to his new assignment was commanding general of McClellan Field. General Hanley is now the commanding general of the Southeast Air Force Training Center.

Succeeding General Giles as Assistant Chief of Air Staff, Operations, Commitments and Requirements, is Brig. Gen. Howard A. Craig, who prior to his assignment served as Chief of Staff for the Mediterranean Air Command.

### BLIND FIRING

Extract from a combat report:

"Saw JU-88 above cloud. I dived and closed to about 1,000 feet, fired from line astern as it entered cloud. Fired five-second burst into cloud at point aircraft last seen. An aircraft was seen to crash near this position at approximately the same time.

"Comment—Very interesting. Reminds us of the story of a fighter pilot in a dog-

fight who lost his opponent and in desperation fired a long burst into the sun and the ME-109 fell out in flames."

### PIF SIMPLIFIED

You wouldn't know the Pilots' Information File these days. The File has been condensed into a single 240-page book containing all the essential information you used to have to hunt for in the old maze of tiny print. More than that, it's now in large clear type with photographs, colored illustrations and cartoons on every page.

And instead of the old system of indexes and cross-indexes, it has an ordinary table of contents which tells you where to find what.

The new PIF will not teach you how to fly and will not serve as a substitute for the Transition Flying Index which still includes the handbooks and technical orders relating to specific equipment, but it is made up of all the general information required by pilots flying any equipment.

The Flight Control Command produced the original book and has the job of seeing that it is kept up-to-date, so the pages are loose-leaf and the index is worked out to permit day-to-day revisions and additions.

Any suggestions of new material for the book should be sent to the Flight Control Command, marked for the attention of Chief, Pilots' Information File Section, Headquarters Region No. 10, Building 145, Patterson Field, Ohio.

### JUST BEING NEIGHORLY

Kelley is as Irish as his name. He's a private first class in the Army and his particular assignment is driving a truck on a 120-mile round trip each day up and down the side of a Central American mountain, carrying passengers and supplies from a Coastal port up to the Army airport, from which bombers go daily to patrol the Pacific and guard the approaches to the Panama Canal.

Under ordinary circumstances you might never have heard of Kelley. But the route of his truck takes him twice daily through

a native town, and somewhere in the past—Kelley won't say just when—he was attracted by the charms of the local belle who ran a soft drink stand alongside the village market. Kelley speaks no Spanish and the girl no English, and their courting has been mainly a battle of eyes. But it has developed and grown in spite of these linguistic barriers.

As regular as a clock, each morning just as dawn is breaking through the mountain passes, Kelley will bring his 2½-ton truck to a halt before the door of the refreshment stand and out he will pop for a fifteen-minute break. Out will come his passengers from the rear, several on each trip, and coffee is the order of the day.

On the afternoon run, back up the mountain, the stop is made again. This time it is "cokes" for refreshment. His girl is always there, neat and pretty and glowing under Kelley's glances.

Day in and day out, this routine is never varied and the legend of "Kelley and his girl" has spread to every AAF base in the Caribbean. Many are the tales told of her beauty and charm, and the way she can be seen leaning out the window of her stand, watching, waiting for the first sight of the khaki colored truck and Kelley as they approach.

But more important still is the attitude of the townspeople, who looked at first with disfavor upon these loud and boisterous "Americanos."

Long since now have they taken the story of "Kelley and his girl" to their Latin hearts, and it is not uncommon for a small crowd to gather at the windows or stand shyly in the doorway while Kelley and his friends have their coffee or their cokes.

And they always have a smile and a nod of greeting for the departing "Americanos"—thanks to Kelley and his own private "good neighbor policy."

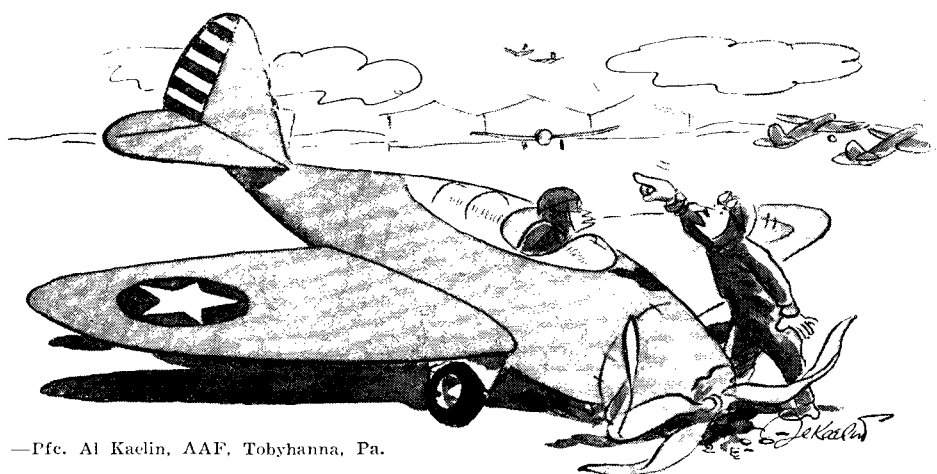
### SETTING THE STAGE

What is the Air Corps? That was the question Playwright Moss Hart had to answer when he eagerly accepted General Arnold's request to do a show about the Army Air Forces.

The answer had to be boiled down to fit a stage, had to be portrayed by a relative handful of men, had to present the emotions and realities of every man in the Air Forces, whether he was sweating out a ship in a fox hole or sweating out enemy tactics 15,000 feet upstairs.

Irving Berlin found the answer to such a question when it was asked of the Army. He went to live at Camp Upton, N. Y., where he had been an EM in the last war. He emerged with the smash hit, "This Is the Army."

But Moss Hart couldn't find any one installation, or even a few installations that reflected the complexities of the Air Forces. So he traveled around for 15,000



—Pfc. Al Kaclin, AAF, Tobyhanna, Pa.

"No, No, Myers!! A three-point landing should include the tail!"

miles or so in a bomber. He lived and flew with men working in every type of job in every type of installation in the Air Forces.

When he finally sat down to write two months later, Hart had gathered so much material he was almost at a loss to know where to begin. Then the next problem presented itself. How was he going to do the show? Irving Berlin had used songs and sketches. Noel Coward had utilized all the tricks of the motion picture to tell a story of the British navy, "In Which We Serve."

The competitive angle didn't bother Hart. He was concerned chiefly with squeezing all the material into three hours on the stage. The result is a dramatic play, with music, in 21 scenes. The music is an integral part of the show, much as it was in Hart's most recent hit, "Lady In the Dark."

The actors, the orchestra and all back-stage personnel were to be recruited from AAF ranks. During the past month and more, extensive tryouts have been held at Air Forces posts to select men who could qualify and who could be released from their present assignment for temporary duty with the show.

Selected personnel were ordered to New York City for final auditions beginning September 15. Rehearsals were scheduled to start October 4. The show opens November 1 in Boston for two weeks, then goes to Washington for a week of final polishing. Broadway will see it the last week in November.

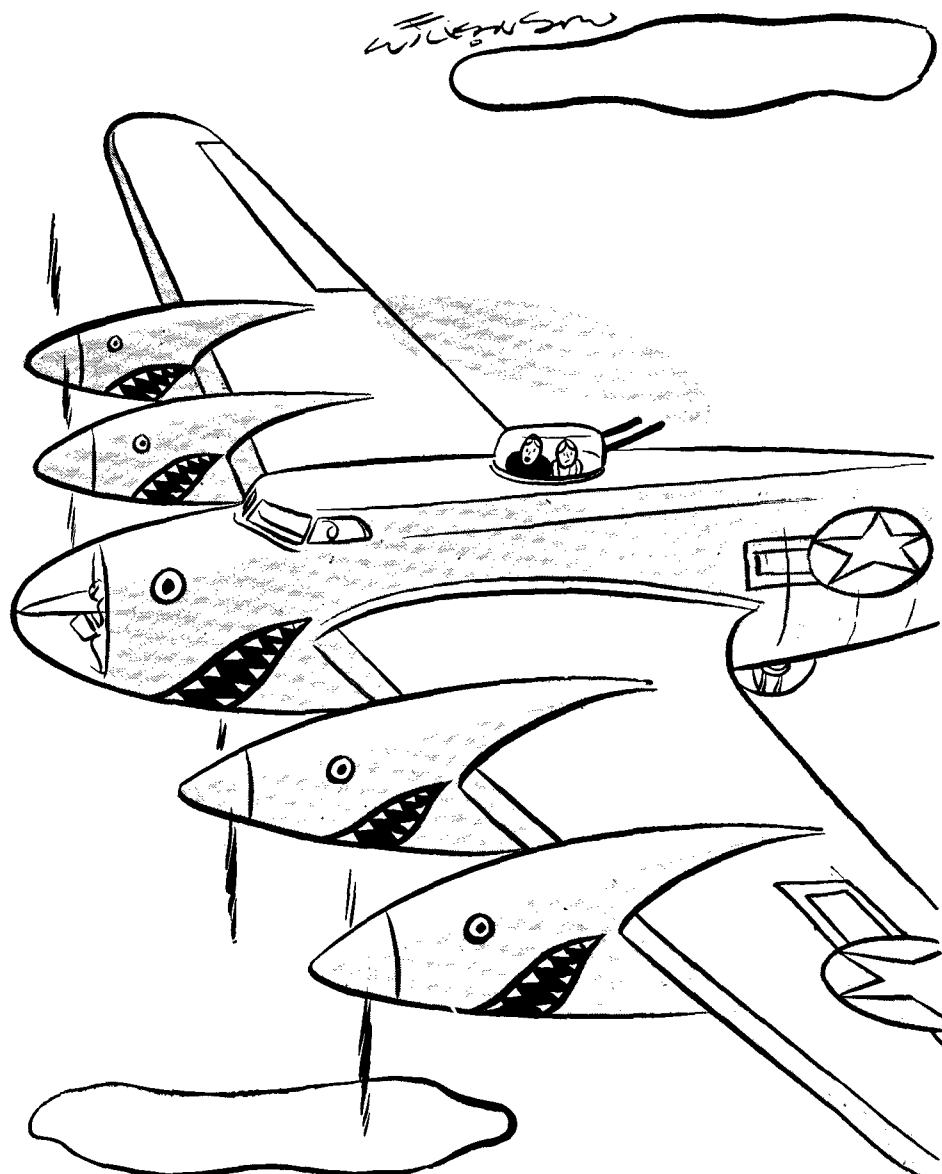
Is the show good? You'll probably get a chance to judge for yourself, since it is almost certain to wind up as a movie. Moss Hart won't commit himself about it. He says he only hopes it begins to be as good as the men of the Air Forces. But his closest friends, who have read all his other shows before production, say this is Moss Hart's "best."

#### WING AND A PRAYER

Two of her engines were knocked out in a raid on Schweinfurt, Germany. For 500 miles "Battlin' Bobbie" hedge-hopped over trees, rooftops and enemy pillboxes, spraying everything in sight with .50-caliber bullets, except when she passed over a prison camp at fifty feet and the captured men rushed into the yard to cheer and wave her on. And while the plane limped along, her crew was praying that the two smoking engines wouldn't blow up. "We made a chapel out of that airplane today," said Tech. Sgt. John Thomas after they finally reached home.

#### THE AIR AGE

After three airmen of the 60th Troop Carrier Squadron bailed out of a glider recently over one of our southern states, they landed without incident and were soon walking down a winding, dusty mountain road. Around one of the turns



"Don't you think we're overdoing it?"

—FRITZ WILKINSON

they came upon a group of the natives, shoeless and wearing tattered hats, sprawled by the side of the road eating watermelon.

"You them fellers that just come down?" drawled an old man in the group.

After he was answered in the affirmative, the old timer bit off another chunk of watermelon and continued, "Ma said she seen some white things in the air. Ma never seen a parachute afore, but she figgered that's what they was."

The old man pointed out the way to town and went back to his watermelon. The boys hiked off down the road. The others on the roadside didn't even bother to look up.

#### PARACHUTES: LOST AND FOUND

Our parachute "business" is picking up. Seven stations report missing parachutes and another two unclaimed chutes in its possession. A little checkup has revealed that these announcements in AIR FORCE result in a number of lost parachutes being returned to their proper stations. We invite all units to utilize this

medium for locating missing or lost parachutes. Here is the latest list:

##### Lost:

Numbers 36-2020, 36-2035, 37-251 and 36-2061 (all Type S-1); return to Post Operations Officer, AAF Technical School, Chanute Field, Ill.

Numbers 42-411448 and 42-387531; return to Operations Officer, Headquarters and Headquarters Squadron, Flight Control Command, Smith Reynolds Airport, Winston-Salem, N. C.

Number 42-63119 (Type S-1); return to Base Operations, AAF Proving Ground Command, Eglin Field, Fla.

Numbers 42-187970, 42-2176, 42-2163, 41-19774, 41-7924, 41-19790, 41-7939, 41-7944, 41-11211, 41-19765 and 41-19788; return to Parachute Officer, Luke Field, Ariz.

Numbers 41-29333 and 41-29335 (lost at Middletown, Pa., on or about April 17, 1943); return to Headquarters, 127th Liaison Squadron, William Northern Army Air Field, Tullahoma, Tenn.

Number 41-27706; return to Base Operations Officer, AAF Basic-Advanced

Flying School, U. S. Military Academy, Stewart Field, West Point, N. Y.

Number 42-92222 (detachable type); return to Operations Office, Headquarters, Midwestern Procurement District, Municipal Airport, Wichita, Kansas.

#### Found:

Numbers 42-9992 and 42-544842; now held by the Parachute Section, Luke Field, Ariz. They may be obtained by contacting the parachute officer at Luke. The chute Number 42-544842 was found in an airplane crash and is beyond repair.

### LOGISTICAL STUDY

The war offers no greater single challenge than the movement of men and materiel to the right places at the right

times. We speak of this as the Battle of Supply; logistics is the formal name.

Well underway in the AAF is the first overall study of the entire supply problem as it pertains to air operations. It is being conducted by the Air Service Command and the AAF School of Applied Tactics, working closely with Headquarters.

The results of the study will be used as a basis for future supply operations. The project involves many important factors. Safety measures to eliminate improper loading have been carefully weighed. Suggested improvements in the movement of heavy items are being given every consideration to prevent costly shifting while in transit. Standardization of packing and crating is being effected. Practice in load-

ing and unloading aircraft engines under varying weather conditions is being recommended for personnel engaged in this work. Specific studies include the movement of an AAF Group under simulated combat conditions to determine major problems and iron out the rough spots right down to the last detail.

The first comprehensive results of the studies were to be made known in the form of a manual, scheduled for distribution by mid-September to squadron levels.

### LAPEL BUTTONS

Officers and enlisted men honorably discharged from the Army during the present war will be awarded lapel buttons to signify their service to the nation.

The button is made of plastic material with gold plating, eliminating the use of critical materials. Its design is simple, a dexter eagle within a circle with the wings extending beyond the circle's edges.

Not yet available for distribution, the buttons are in the process of manufacture under the direction of the Quartermaster Corps. Full particulars will be publicized when a sufficient number have been manufactured so that eligible persons will know how to obtain them.

### WASP FOR WAFS

By the time some of you read our story on the WAFS in the last issue, you probably were aware that the title of that organization of women pilots of the Army Air Forces had changed. Announcement of the change came after press time.

The official name of the women's pilot organization is now the WASP, short for Women's Air Force Service Pilots. The WASP will include the WAFS plus all other women pilots likely to be engaged in flying jobs other than ferrying.

The age limit for entrance into the WASP has been changed from 21 through 34 to 18½ through 34. Thirty-five hours of flying time is still required for entrance. Applications are taken by the Director of Women Pilots, Headquarters, Army Air Forces, Washington, D. C.

### TABLE MANEUVERS

You who have had overseas experience know how strange the commonplace things of other countries can be. So do some of our Allies. Take corn (of the on-the-cob variety), for instance.

During a tour of this country, members of the British First Composite Anti-Aircraft Battery were frankly puzzled as to methods of attacking this article while messed at a base. After a few futile stabs, one of the visitors asked the correct procedure for eating corn.

"Just hold it in both hands," advised a sergeant. "You eat it like you're playing a harmonica."

"Thank you very much, sir," said the polite Britisher. "By the way, what is a harmonica?"—THE EDITOR. ☆

## ☆ MEDAL of HONOR ☆



SGT. MAYNARD H. SMITH



FIRST LIEUT. JACK W. MATHIS

"For conspicuous gallantry and intrepidity in action above and beyond the call of duty. The aircraft of which Sergeant Smith was a gunner was subjected to intense enemy anti-aircraft fire and determined fighter airplane attacks while returning from a mission over enemy occupied continental Europe on 1 May 1943. The airplane was hit several times by anti-aircraft fire and cannon shells of the fighter airplanes, two of the crew were seriously wounded, the aircraft's oxygen shot out, and several vital control cables severed when intense fires were ignited simultaneously in the radio compartment and waist sections. The situation became so acute that three of the crew bailed out into the comparative safety of the sea. Sergeant Smith, then on his first combat mission, elected to fight the fire by himself; administered first-aid to the wounded tail gunner, manned the waist guns, and fought the intense flames alternately. The escaping oxygen fanned the fire to such intense heat that the ammunition in the radio compartment began to explode, the radio, gun mount, and camera were melted, and the compartment completely gutted. Sergeant Smith threw the exploding ammunition overboard, fought the fire until all the fire fighting aids were exhausted, manned the workable guns until the enemy fighters were driven away, further administered first-aid to his wounded comrade, and then by wrapping himself in protecting cloth, completely extinguished

"For conspicuous gallantry and intrepidity in action above and beyond the call of duty in action with the enemy over Vegesack, Germany on 18 March 1943. Lieutenant Mathis, as leading bombardier of his squadron, flying through intense and accurate anti-aircraft fire, was just starting his bomb run, upon which the entire squadron depended for accurate bombing, when he was hit by the enemy anti-aircraft fire. His right arm was shattered above the elbow, a large wound was torn in his side and abdomen, and he was knocked from his bomb sight to the rear of the bombardier's compartment. Realizing that the success of the mission depended upon him, Lieutenant Mathis, by sheer determination and will power, though mortally wounded, dragged himself back to his sights, released his bombs, then died at his post of duty. As the result of this action the airplanes of the ——— Bombardment Squadron placed their bombs directly upon the assigned target for a perfect attack against the enemy. Lieutenant Mathis' undaunted bravery has been a great inspiration to the officers and men of his unit."

the fire by hand. This soldier's gallantry in action, undaunted bravery, and loyalty to his aircraft and fellow crew members, without regard for his own personal safety, is an inspiration to the armed forces of the United States."

(From General Orders No. 38, War Department)



# THE 'B'-40 OVER BURMA

*By Capt. Luther Davis*

10TH AIR FORCE



A P-40—'B'-40 to this squadron in India—picks up a 1,000-pound bomb.

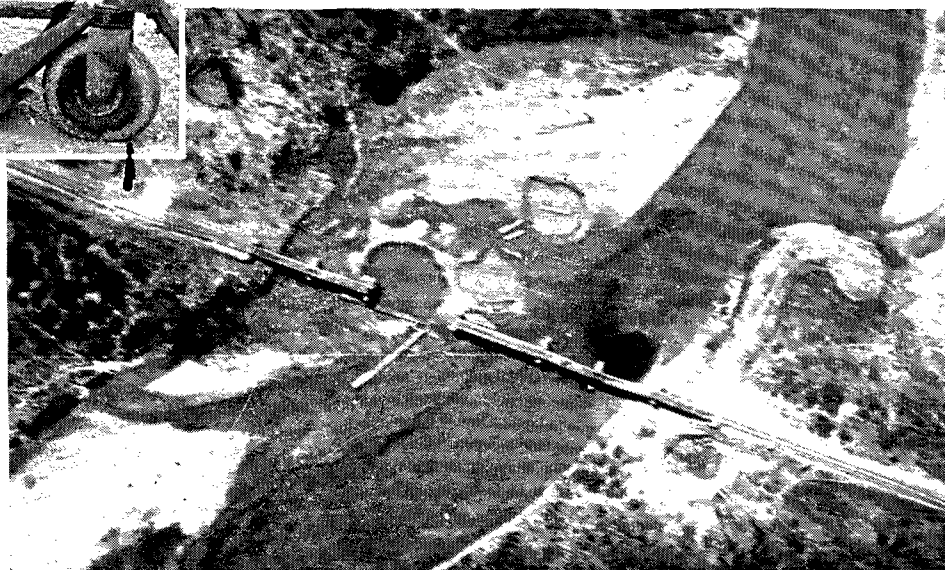
IN India, where the rainbow and the supply line both come to rather disappointing ends, we've had to do a lot of improvising. Airplane landing-light bulbs serve in movie projectors, salvaged gaskets are items of barter with local tribesmen who use them as anklets—and the P-40, standard American fighter plane in this theatre, has been converted to the "B"-40.

The news is not that peashooters carry bombs—all over the world they do that—but that single-engined fighters have been operated successfully for more than four months as medium bombers specializing in 1,100-pound pay loads in addition to the weight of normal fighter armament. It's not an occasional fair-weather enterprise but part of the established operational routine of the 10th Air Force—and a development that has worried the Japs considerably.

When the first "B"-40 raids occurred, the enemy radio at Rangoon broadcast that we had "a new type of dive bomber," but when the Japs lost ten Zeros in aerial combat with the "bombers" the whole subject was promptly dropped.

Reason for this general disregard of almost all tech orders was the fact that the Japs were supplying forward activities in northern Burma over a single-track railway and a narrow road, both well-sprinkled with bridges. The P-40s, using 300- and 500-pound bombs, blasted away at the targets throughout last February but the Japs were ready with repair gangs and extra rails. Within 48 hours an officially "destroyed" bridge was usually bearing the weight of India-bound Japs, and the bombing had to be done all over again.

In March the enemy was still advancing and it looked as if we would have to



The remains of a railroad bridge at Namkwin in northern Burma after a visit by 'B'-40s.

divert B-25s from more important tasks farther afield to do the job originally assigned to fighters. Thousand-pound demolition bombs were delivered to the fighter bases and plans made to send some bombardment squadrons there.

But Col. John E. Barr, executive officer of a P-40 group, took a good look at those 1,000-pounders and then spent an afternoon under his P-40 with his eye on the rivets and his conscience with his God. Next day a short and sober report came into 10th Air Force Headquarters: One P-40 with another P-40 upstairs as top-cover had knocked out the bridge south of Mogaung. "Ordnance expended: 1,000-pound bomb."

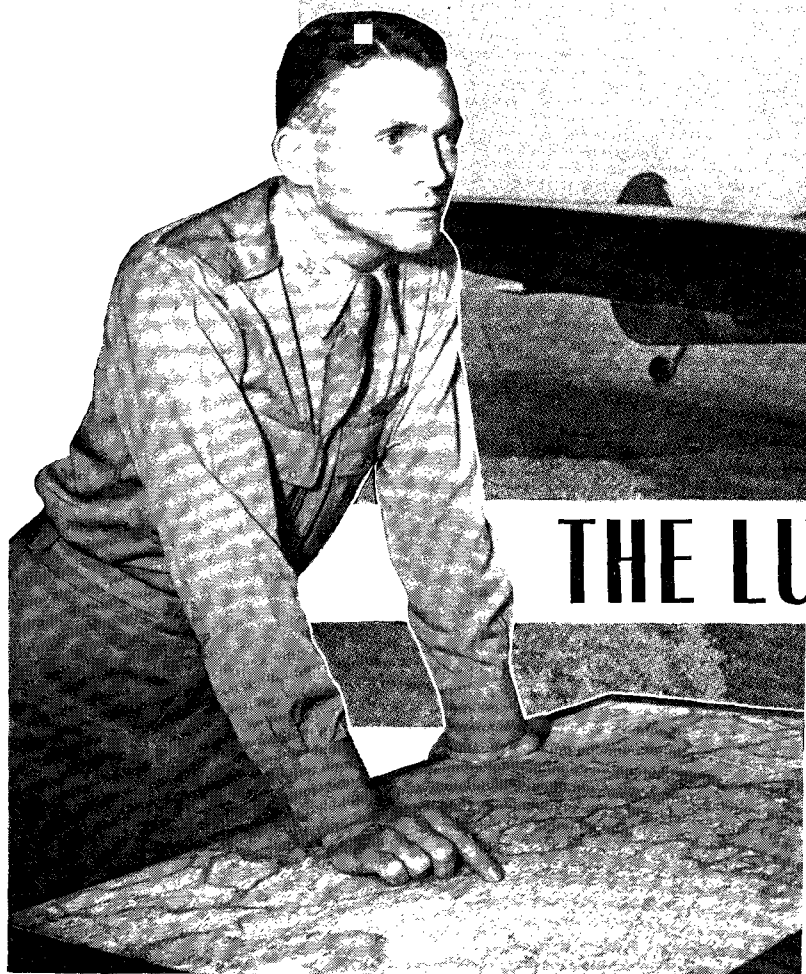
PHOTOGRAPHS showed that the trestle hadn't been knocked down or askew; it had simply ceased to exist. On it enemy repair crews spent a great deal more than 48 hours and by the time they had the span "in" again, Colonel Barr had drilled five other pilots in the technique of the 1,000-pounder, and the bridge was thoroughly atomized once more. The answer to our problem has been found in the in-

creased concussion of the heavier weight of explosive. Those B-25s never had to be diverted.

The performance of the "B"-40 is astonishingly close to that of the P-40 with standard armament but no bomb. To reach the Nips these 10th Air Force pilots have to climb over 8,000-foot mountains in a short time. Where such an initial climb is not necessary, the "B"-40 might well become the "A"-40 and operate as a low-level attack aircraft.

The policy of the 10th Air Force is always to give these fighter-bombers plenty of top cover—a luxury, incidentally, which our B-25s and B-24s have yet to enjoy. As a result, it can be reported that four months of operation—just under 100 sorties—have been completed without the loss of a single "B"-40 for any reason. This record has been accomplished despite every conceivable kind of ground fire from small-arms to Bofors—and an occasional rock thrown high.

Someday the people who have nothing to do after a war but figure out what really happened empty-umph months ago will give thought (Continued on Page 55)



# THE LUFTWAFFE AT BAY

*By Col. Fred M. Dean*

**FORMER CO OF A SPITFIRE GROUP,  
NORTHWEST AFRICAN TACTICAL AIR FORCE**

**T**HE German airman on the losing side of the fence is a despondent, almost panic-stricken fighter in contrast to the Nazi flyer who has things his own way.

Our Spitfire group—one of the two Army Air Forces groups flying British fighter planes—had the opportunity to view him on both sides of the fence. We met him over France last fall. We fought him in his prime over Dieppe. We cracked him when the tables had begun to turn in Tunisia. Then over Pantelleria. Then Sicily.

There was scarcely any contest in the sky over Sicily. The few fighters we met seemed more interested in turning tail and evading combat than in attempting to press interference with our invasion operations. The transports and bombers we encountered likewise were easy pickings.

Not that the turn of events in the Mediterranean and the feeble, futile efforts of the Axis air arm in that theatre should be construed as an indication that the Luftwaffe is all washed up. On the contrary, we have every reason to believe that the enemy has plenty of fight left up his sleeve—plenty of good pilots and plenty of good planes.

The fact that they were not present in force over Sicily can be attributed to three major factors: (1) the apparent

withdrawal of large numbers of aircraft to other fronts, (2) our efficient bombardment of enemy airdromes and supply centers both on the island and on the Italian mainland during the "softening up process" which preceded the invasion, and (3) the swift advance of our ground forces on Sicilian airfields once the invasion was underway.

**O**UR job with the invasion forces began the day before the initial landings, which took place on July 10. We had been based on Malta for about two weeks and during that period we had flown cover for bombardment aircraft on missions directed against targets on Sicily. When the assault convoys began moving on the island we formed a part of the protective air cover.

None of us shall ever forget the sight of those ships—all sizes ranging from landing craft to the escorting battlewagons. It was by far the largest concentration of surface vessels ever gathered together, and to us flying overhead they appeared as a swarm of water creatures moving against an island that could not possibly be successfully defended.

Enemy air activity was relatively negligible, and in a way we were surprised with the lack of opposition. In anticipa-

tion of the heaviest possible resistance from the air, our group had been augmented to a point where we were considerably over-strength. But despite the fact that our casualties were only a fraction of what we had been prepared for, the extra pilots proved to be greatly needed. They enabled us to rotate our flying personnel at a time when we were running far more missions than we ever had before, even those flown on the Dieppe raid.

During those first four days of the Sicilian invasion, our planes were in the air continuously from long before daylight until after dark. All told, we flew more than 400 sorties during that period, with the new men taking their regular turns in the air to provide much-needed relief for group personnel regularly assigned. Our bag for the four days included four bomb-carrying FW-190s, three DO-217s and one JU-88, without any losses on our part.

Seven of the eight planes were destroyed on the second day of the invasion when the enemy threw up the bulk of his air opposition against the assault forces. After this attempt, enemy air activity dwindled perceptibly.

Our ground crewmen, who on the first day or two had awaited our return

## There was scarcely any contest in the sky over Sicily for this AAF Spitfire group.

from missions with even more anxiety than usual, soon began to show obvious disappointment when more and more of our Spits returned with the white patches still over their guns. That meant to the men on the ground that our guns had not been fired. When Spitfires are conditioned for a mission white patches are placed over the holes of the recessed machine guns in the wings, and a plastic cover over the cannon. These patches are not removed prior to take-off, so it is easy enough to tell whether any action has taken place when the planes return from a mission by the condition of the white covers. Frequently on clear days, ground crews can determine quite accurately which ships have found good hunting—and which haven't—before their wheels ever touch the runway.

A portion of our ground echelon had moved onto Sicily with the first wave of assault troops, and on the third day of the invasion we were able to fly our group into an airdrome just north of Gela, about ten miles in from the beach.

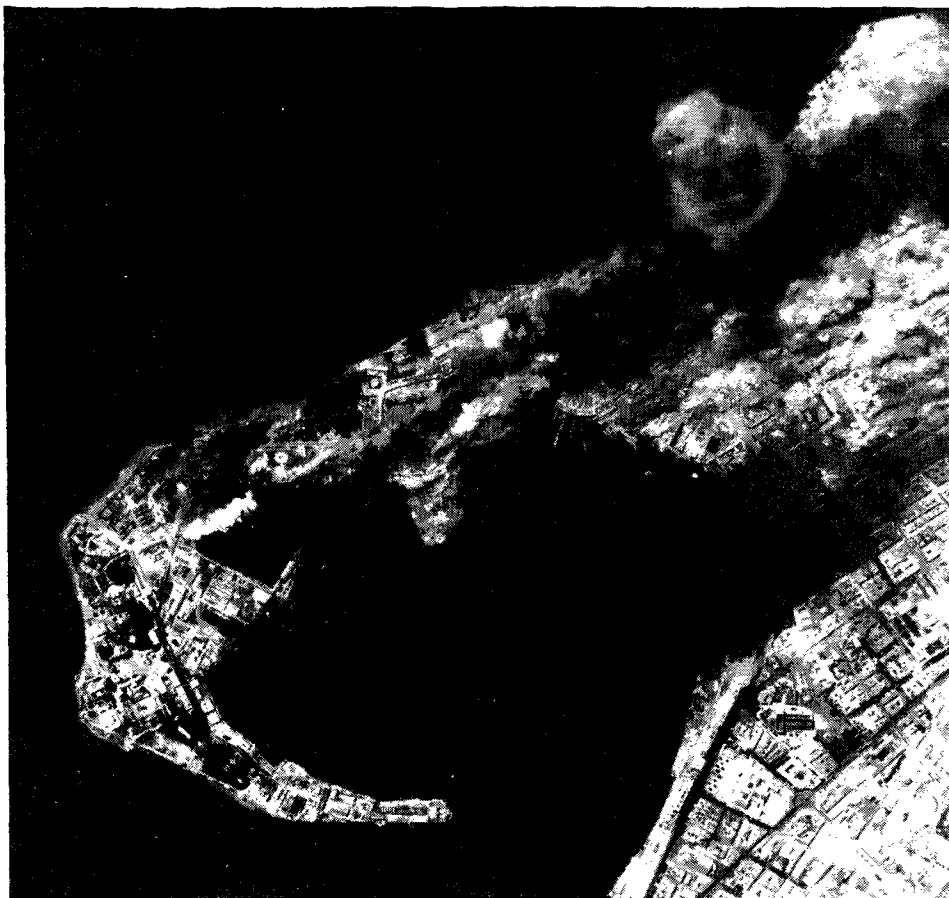
Except for a few bomb craters left by our bombardment aircraft on raids before the invasion, the field was in excellent condition. It wouldn't have been, however, had the retreating enemy forces succeeded in setting off approximately seventy-five 500-pound bombs they had left around the perimeter and under the runway. These bombs were wired together to be set off simultaneously but our ground men cut the connections and succeeded in removing the bombs before any damage was done. Supplies for the airbase also were sent along with the assault convoy, so when we moved our fighters into the field everything was in complete readiness to begin operations.

Ours was the first group to operate from a captured Sicilian base. All facilities at the field had been left intact by the enemy. The airdrome had one of the most complete night lighting systems I have ever seen—better than at many of our airfields in the States. Concrete revetments were scattered about the edges of the base. The few German aircraft left on the field were gassed up and ready to fly.

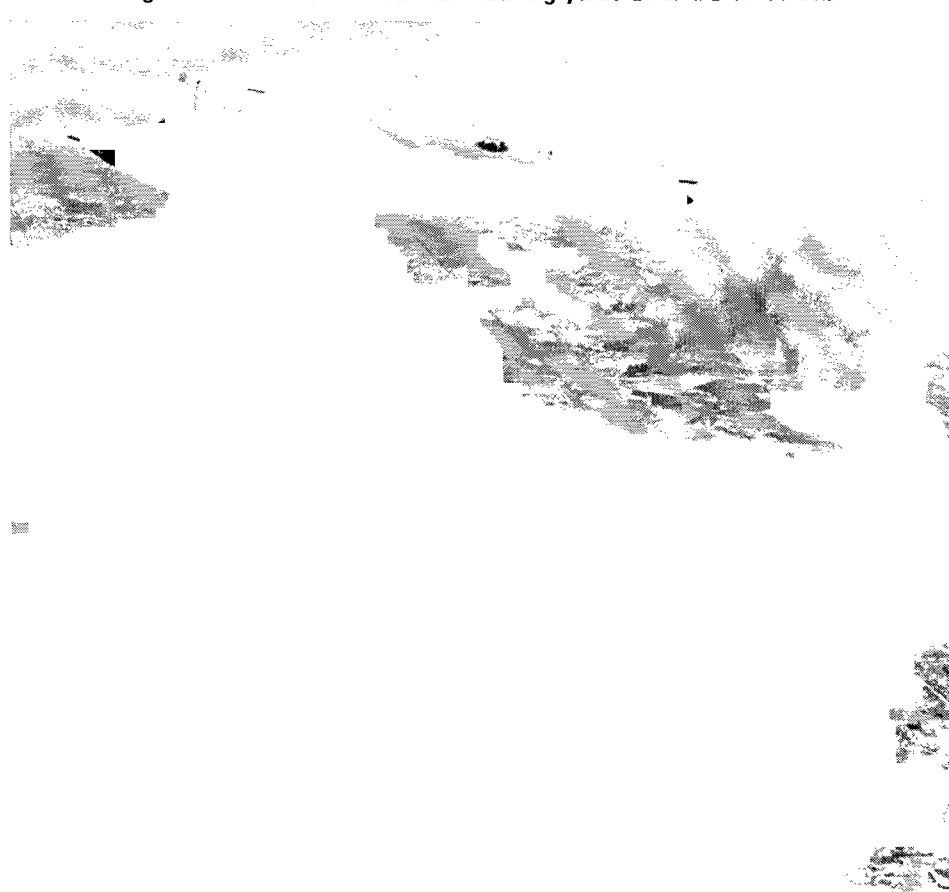
At an airfield nearby, more than 100 FW-190s and ME-109s were abandoned in operating condition, loaded with gasoline. We made use of the additional fuel but only after it had been thoroughly tested.

On our first night at the new base, enemy artillery shelled us intermittently but no casualties and little damage resulted. A flight of JU-88s raided us on the second night but our operations were not seriously affected.

*(Continued on Page 56)*



The "softening up process" preparatory to the invasion of Sicily, included the steady, relentless bombardment of key Axis shipping centers and airdromes on both the island and the Italian mainland. In the four weeks ending July 26, AAF planes flew 12,583 sorties and dropped 12,460 tons of bombs on these targets. In the photo above, smoke rises from fires and explosions in Messina's shipping areas. A flight of B-26s (below) passes over Rome on the way to bomb Campino airdrome. Smoke is rising in the upper right corner from the Lorenzo marshalling yards after a B-17 attack.



# DREAM CREW

By Capt. Arthur Gordon

8TH AIR FORCE

CAPT. DARRELL L. SIMS and his crew are grounded now. They have flown 25 combat missions in three different theatres of operations under all conditions, bombed their targets, sank subs and shot down enemy planes. Yet, not a single crew member has ever been scratched and not one enemy machine gun bullet or cannon shell has even pierced the metal hide of their B-24. So, of course, nobody has bothered to write a story about them.

But this is the kind of bomber crew AAF generals dream about—the kind that makes Goering tear his hair. A crew that goes out and bombs and comes back—intact.

The trail of this crew leads literally from the halls of Montezuma to the shores of Tripoli with the famous B-24 group, The Traveling Circus. They met their first Germans in June, 1942, in the Gulf of Mexico when they sighted a sub and neatly bracketed same with a pair of depth charges. Four months later they shot down their first enemy fighter high over the locomotive factories at Lille, springing from a base "somewhere in England." In three more months they were in Tunisia, digging dust out of their cars and nostrils, laying 1,000-pound eggs on Rommel's rear guard and dodging flak over Naples. Even today, back in England, the crew's new shoes still crunch Egyptian sand on the floor of the sturdy old B-24.

When their medals finally catch up with them, the crew will muster nine Air Medals with three oak leaf clusters apiece, and nine Distinguished Flying Crosses. But no Purple Hearts.

If you ask the boys to account for their phenomenal safety record, they grin and refer you to the last three digits of the serial number of their plane: 711. A rather lucky number. A number, incidentally, which explains the otherwise inexplicable name they gave their ship: "Jerk's Natural." The "jerk" in question was the original pilot, Lieut. (now Maj.) John L. Jerstad of Racine, Wis., who at present is a combat wing operations officer. He skippered Jerk's Natural through the first five missions.

Except for Major Jerstad, the tunnel gunner (who was grounded for medical

reasons in Africa) and Co-Pilot Robert H. Hudspeth, of Verdi, Nev., missing from a raid in another plane, the original crew has been taken off combat status intact. At the moment all of them are engaged in training new crews. As for going back to operational flying, most of them expect it sooner or later but none is in any particular hurry. After all, they'd been flying and fighting steadily for ten months, ever since that June evening over the Gulf of Mexico when they were on their way back to Fort Myers from a cross-country to Chicago and looked down to see the slim outline of a sub.

"We had two depth charges that we'd wheedled out of the boys at Barksdale, La.," recalls Captain Sims, a Jonesboro (Ill.) red-head. "We made our run out of the sun, but they must have spotted us because by the time we dropped the ash-cans she was almost submerged. However, our enlisted bombardier, Staff Sgt. Edward W. Eichmann of Milwaukee, did a sweet job—put 'em right alongside. They must have knocked the sub down, because nothing came up but a lot of big bubbles. Next day we heard the Navy went out and found an oil slick covering acres. Never did hear whether we were officially credited with that baby."

The group finally left Fort Myers, officially credited with one sub definitely destroyed and two probables. In England Jerk's Natural flew in most of the early raids on targets in occupied France. Once or twice she was scratched or dented by flak fragments, but tight formation flying and good shooting kept enemy fighters from putting a single slug into her. Where other B-24s limped home on three engines or fired rockets to warn the waiting ambulance that wounded were aboard, Jerk's Natural went out and bombed and came back and that was that. Her record of the fewest number of turn backs for mechanical reasons of any plane in the group was attributed to the untiring work of her crew chief, Master Sgt. S. M. Benson of Darien, Conn.

Over those concrete sub shelters Capt. Maurice Elstun, bombardier, of Ross, Ohio, began to make himself a reputation. It takes a lot of guts, in case you

don't know it, to keep your plane boring into a solid wall of flak, especially after some of the others have tripped their bomb switches and peeled off. Captain Elstun, then a lieutenant, wouldn't release his bombs until he was convinced that he was on the target. And although his deliberate methods gave the rest of the crew a fine case of jitters at first, they eventually came to respect him for it.

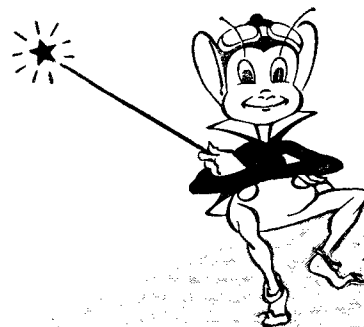
Life was rugged enough in England. Once they spent most of the night loading their own bombs and finished just in time for briefing and the take-off. But Africa was tougher still. Dust and sand and a pint of water a day. Cold nights and hot days and long flying distances. That was the toughest part—the distances that had to be flown after combat. It wasn't like England, where you do your fighting and duck for a home base that isn't so far away. The long post-combat grind was hard on men and on engines, but they kept going.

THE first trip over Naples was a breeze, but the second was as rough as anything over the Brest peninsula. The jerries had moved in after the first raid, and the jerries are good. The plane next to Jerk's Natural was shot to ribbons. Looking out of his side window, Waist Gunner Samuel J. Delcambre, a swarthy Cajun from New Iberia, La., could see the crew of the stricken ship collapsing over their guns as the B-24 plunged downward. But still luck—or more probably a happy combination of luck and skill—seemed to be riding with Sims' crew.

Coming back from one raid on Italy they picked up an agitated news broadcast in Italian, and one of the boys knew enough of the lingo to realize that they were listening to a description of their own raid. On another occasion, over Palermo, things were so quiet that they didn't bother to switch off the Jack Benny program to which they were listening, but unloaded their bombs to the unusual accompaniment of Rochester's hoarse chuckle. In two missions, pinch-hitting for the absent tunnel gunner, Intelligence Officer Howard Larry Dickson of Dayton, Ohio, is alleged to have read all of



## The story of a B-24 and a crew that flew 25 combat missions in three theatres without a scratch.



Shakespeare's *As You Like It*. Between the acts, he got in plenty of shooting, and although he doesn't claim any fighters as destroyed, he does say he put considerable lead into some of them. Officially, Jerk's Natural was credited with two enemy fighters shot down in Africa.

The radio operator, long tall Tech. Sgt. Robert H. Harms of Alton, Ill. was responsible for saving several lives when a B-24 was shot down five minutes after unloading its bombs over Sousse. He saw six men bail out and float down into the Mediterranean. Instantly he called Malta. Malta was unable to send help, but it did the next best thing. On the International Distress Frequency it called the Germans and told them of the air-men's plight. The Germans obligingly went out and picked up at least two of the survivors.

**FLYING** over the desert, Jerk's Natural had its only really close call. One of the waist gunners, pouring a stream of lead at an enemy fighter, swung his .50 caliber too far and shot off one of the Liberator's trim tabs. As a result, Sims couldn't hold the ship in formation. She dropped back, along with another crippled B-24. It was just by chance that the fighters chose the other cripple as their victim. They ganged up on it and shot it down while Sims' ship staggered in safely.

The only time the crew ever bothered to put on parachutes was on one occasion when the weather was so bad that the navigator, First Lieut. Rollin C. Reineck of Van Nuys, Calif., had trouble finding his home base. So did all the other planes in the group. In the group commander's plane, preparing for a crash landing, the crew threw everything movable overboard, including a case of practically priceless eggs. (This was a mistake, calling for elaborate apologies and explanations later!) But the Jerk's luck held. At the last minute, almost out of gas, Sims set her down safely.

They all worked hard in the desert under difficult conditions. Tech. Sgt. Phaon T. Wenrich of Pine Grove, Pa., flight engineer and top turret gunner, kept the Liberator's big radial engines turning through 400 hours of grueling

flying—200 of them on actual combat missions. For several months, in fact, Jerk's Natural did not see the inside of a hangar—a tribute to the skill of the men who built her.

**MORE** than once Col. Ted Timberlake took over the plane and crew, "ranking" the pilot out of his seat. This was not hard to do, inasmuch as for 23 missions all four officers remained second lieutenants. To commemorate this melancholy fact Elstun wrote a poem, called "The Gold Bar Boys," which they used to recite sadly to one another over the interphone. Fortunately, the situation has been remedied somewhat since the return to England.

Actually, as is the case in most bombers, rank meant nothing in the air. Staff Sgt. J. R. (Peewee) Lawrence of Colwin, Pa., crouched in his tail gun position, was just as important as the pilot or bombardier. If Waist Gunner Howard G. Crissman of Butler, Pa., failed to keep

his gun clean, the result might be disaster for them all. They all knew it and acted accordingly.

When the boys left the States in their nice new B-24 they decided, in a spasm of neatness, to keep it clean and ship shape. To achieve this praiseworthy end, they installed two gallon tin cans, half filled with earth, as receptacles for cigarette butts and other trash. Every time they landed on the northern route to Britain, they emptied the trash and added a little soil to keep the cans half full. They kept doing this in Libya and Egypt, with the result that those cans are now filled with the earth of three continents. Today they are enshrined on a closet shelf, somewhere in Britain, waiting for the last lap—the trip back home—whenever the happy day comes.

So that's the story of a bomber crew that never did anything except the job it was supposed to do. No heroics. No superlatives. Just a job. With two tin cans of sand to remember it by. ☆

**Capt. Darrell L. Sims, red-haired pilot from Jonesboro, Ill., led the crew of "Jerk's Natural" to a perfect record.**



Early this summer, William Howard Stovall, Jr., of Stovall, Miss., was accepted for pilot training in the Army Air Forces. His father, Col. William H. Stovall of the 8th Fighter Command, who was credited with destroying eight German planes in the first World War, wrote young Stovall the following letter from England:

# Dear Bud-

8 June 1943

**D**EAR Bud, I can't tell you how thrilled I was to get the cablegram from your Mother saying that you had been chosen a pilot. Naturally I hope that you will become a fighter pilot. Of course I know that it depends upon the need of the service at the time whether you are sent to fighters or light or heavy bombers. I know you will do a good job at either.

But if you should happen to become a fighter pilot, it would not hurt for you to begin to train yourself for the job now. I am going to be presumptuous enough to give you some advice drawn from my experience in the last war, from my observations in this one, and from numerous talks and conferences which I have had with the leading fighter pilots of the RAF and of the American Air Forces operating in this theatre.

There are four very definite things that the successful fighter pilot needs which I will set down here in order of their importance:

## 1. Air alertness

2. Expertness in gunnery.
3. Efficiency in flying.
4. An aggressive spirit.

I will attempt to explain to you what I mean by the above and also to advise you what you can do in addition to the splendid training that you will be given to develop yourself as master of these arts.

**A**ir alertness is the ability to see and to know what is going on around you. It is the ability to pick up distant specks on the horizon and identify them as aircraft, either friendly or enemy. The pilot who is able to see his enemy before his enemy sees him gains a tremendous advantage. He is able to begin immediately to employ cloud cover and the sun so that the enemy can be ambushed, and to gain altitude or position of advantage for attack. The battle will be half won if this is attained.

You can train your eyesight to accomplish air alertness. As you sit on the flying line, continually scan the sky. Play games with your associates as to who can see an incoming plane first. It is a matter of eye training, pure and simple. You have shot ducks with me enough to know the importance of eye training. The principle of air alertness really does go into the duck blind.

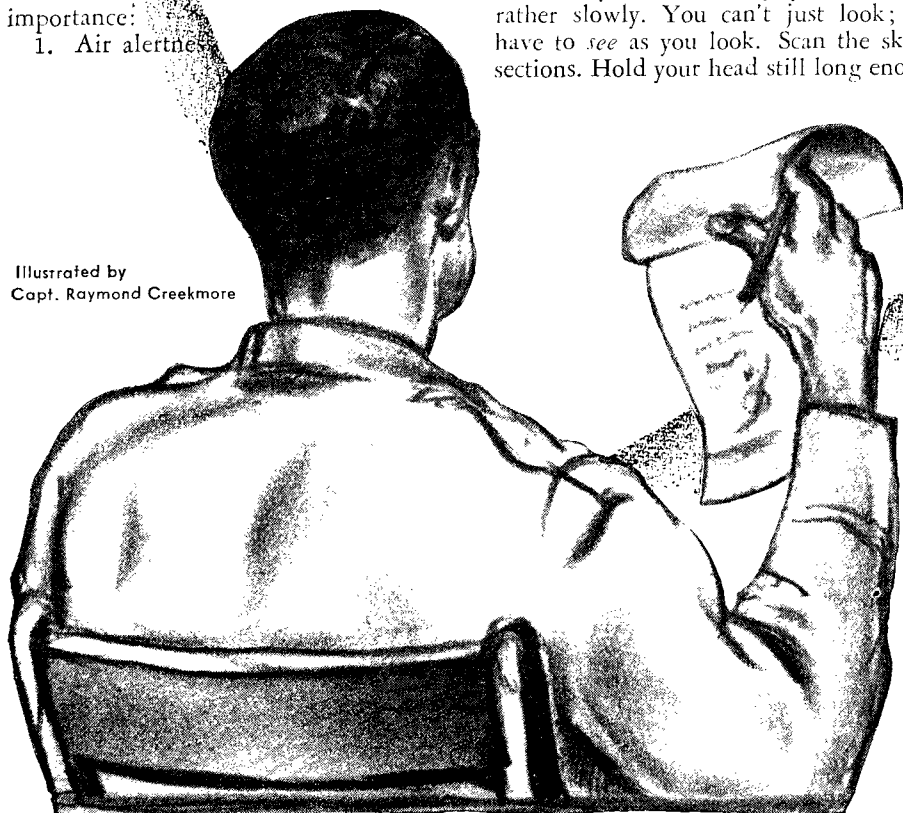
When you scan the sky, you must do it rather slowly. You can't just look; you have to *see* as you look. Scan the sky in sections. Hold your head still long enough

to cover thoroughly that part of the sky within the arc of your vision. When that part of the sky is thoroughly scanned and nothing is found in it, move to another arc and scan it just as closely.

Sometimes air alertness comes too late to our fighter pilots on actual combat operations. Through nervousness they scan the sky too quickly and therefore overlook aircraft that are easily within their line of vision. When you are flying, be continually on the watch for other aircraft in the air. If you have a buddy on the field, let him count the number of aircraft in the air from the ground while you attempt to count them from the air. Do the same for him when he goes up. Through your long period of training, continuous practice like this will help you pick out aircraft instinctively by the time you are ready for operational missions. This training will help you remarkably whether you be bomber or fighter pilot.

**Y**ou may think it strange that I place more importance upon the mastery of your gunnery than upon the mastery of your aircraft but I do so advisedly. Modern fighter planes are so fast that only those pilots who are thoroughly masters of the theory and art of deflection shooting and are thorough masters of the sight are successful. The only excuse for a fighter plane at all is the fact that it is a platform for machine guns to be borne aloft. Therefore, the man who learns to fly an airplane beautifully without knowing how to employ the guns that it carries is more or less like a ground machine gunner who knows how to drive the truck that pulls the gun but does not know how to shoot the guns that the truck pulls.

To aim your machine guns you naturally must aim your plane. Therefore, in your solo flying continually practice aiming your plane at various objects both in the air and on the ground. There must be something along the cowling that you can use as a sight. Learn to fly with the sole purpose of being able to handle a plane to bring it into proper aim. If they have synthetic training devices which teach the theory of deflection shooting, never miss an opportunity to practice on them. I know that the actual gunnery and air-to-ground firing and air-to-air firing that you get will be limited in your training course to a specific number of rounds. However, this does not keep you from doing "dry" shooting as I have suggested. You know yourself, when I first taught you to shoot a shot-gun, that the first thing I did was to teach you how to stand and how to bring the gun naturally up to



Illustrated by  
Capt. Raymond Creekmore

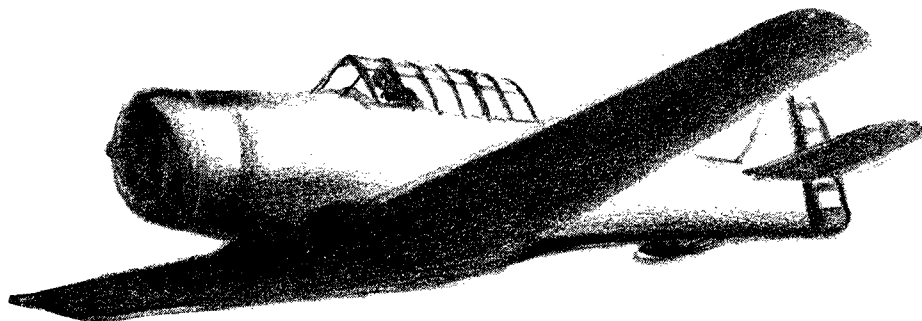
your shoulder. After you had mastered this dry shooting you began really to hit.

All of the great pilots of the last war—and of this—spent hours fooling with their guns and spent hours on the subject of deflection shooting, range estimation, and the like. You can teach yourself range estimation in the ordinary course of your flying training. So many of our pilots make the mistake of beginning to shoot too quickly and finishing their bursts when they should be beginning them. This is because they have not taught themselves to judge distance and range. If I remember correctly, the last time I took you and Oscar duck shooting you raised hell with me because I told you to get up and you missed and alibied that the ducks were out of range—although I killed two after you had finished shooting! Get your range estimation down to a science. You can do it.

It goes without saying that the better your pilotage the better advantage you can maintain in aerial combat and the more confidence you will have in yourself and your aircraft. If you are able to handle it instinctively, you will be able to concentrate upon your shooting and your deflections. However, the evasive actions taken and the handling of the aircraft in combat are not always altogether in accord with the smooth rhythmic flying that they teach you in acrobatics in flying school. However, it is necessary for you to be proficient in smooth acrobatics in order that you may instinctively recognize and handle your aircraft and understand thoroughly its every reaction to the controls. The purpose of smooth acrobatic flying is to be able to bring you into shooting position. Smooth acrobatics are not good for evasive action. This can be taught later, so do not try it during training unless under specific instructions. I don't know of anything that I can tell you to do over and above what your instructors might tell you to become proficient in flying. The pilots that we are receiving are beautifully trained. Listen and learn is my best advice.

ALMOST any American boy who is angry enough at the disruption of our happy and peaceful life and who wants to maintain the freedom of the individual for which our grandfathers and great-grandfathers fought will have an aggressive spirit when it comes to fighting the Hun. However, that aggressive spirit can really be capitalized on and made effective by a thorough mastery of the first three categories of the qualifications of a successful fighter pilot: confidence in your air alertness, confidence in your ability to shoot and hit when you shoot, confidence in your flying.

You have always been a good student; you have always done your level best to be proficient in whatever you undertook,



and I might add that by and large you have been tremendously successful and a son to make any parent proud. This is a tough game that you are in. It is a game in which you play for keeps. It is, I hope, the toughest that you will ever have to be put up against. I wish I could see you and talk to you. The chances of my getting back before you finish your training are slim. I can only hope that maybe the god of good fortune will send you this way—not that it is easy here because it is not, but because I would so much like to be in a position to advise you and help you with whatever knowledge I may have.

I trust you are not worried about the slight impediment to your eyesight. I doubt very much if the doctors would have passed you if your eyesight had not been perfectly OK. Just forget about it and go ahead and train yourself to the best of your ability as I have outlined above. Don't forget that I, who possibly know you best, never have and never will doubt your courage, your perseverance, your determination and the high quality of service which I know you are willing and capable of rendering to your country in this time of need. Devotedly,

Dad.

Dear Howard,

I am almost as delighted as your old man at your getting in the Air Force. I feel confident that as a chip off the old block you will do well and make us all proud of you. Your Pa's advice in the above letter is of the best, and I can offer no better.

The best of luck to you and hoping I have you in my command some day.

Frank O'D. Hunter  
Brig. Gen., U.S.A.

Dear Bud,

I call you that because your father and I are good friends from the last mix-up, and together in this one, and I've heard so much about you from him that I really feel I'm well acquainted with you.

We were all pleased to hear you are going into the Air Corps, and all want to wish you the best of success. Naturally, we feel this is the one branch of the service to be in, and we also hope you choose the fighter side of the Air Corps, although our Bomber Command is doing great things. I have had the pleasure of making two trips with them into Germany and

France, and they are really pouring it on the Hun both in the air and in their bombing. I want to indorse everything your father has said because he has given you the real dope. Speeds are greater and firepower much greater in modern planes, but fundamental principles remain the same. Learn how to shoot upside down and every other way with targets at every angle, and develop your air alertness and you will beat even your father's wonderful record.

We hope to see you over here one of these days before long, regardless of where you go. Carry on with your Dad's spirit, and we will continue to hear great things from you.

All best wishes,

Jack Seerley

Dear Bud,

Listen to all these old men talk! Now here's the "pukka gen" from a newcomer. I've trained and fought over here since the Battle of Britain and if I'd have had advice like this while training I'd probably be a hell of a lot better combat pilot and wouldn't have made as many mistakes. Just lucky the mistakes haven't been too bad so far. Look, boy, you've got a pretty wise dad, but I just want to add that everything, I repeat, everything, he has said if studied and used will be of incalculable value when you meet the enemy. Everything he says in those four paragraphs is what the "aces" have been doing over here since the start. I'm sure you'll profit by what he's said. I hope to meet you soon and have the pleasure of flying with you.

Lots of luck,

Pete

Dear Howard,

I can't possibly be more in agreement with what your father says. As a matter of fact am sending a copy to Elliott Springs' son who is also a cadet now. I have one thing to add and that is I believe you will automatically find yourself doing things that are not in the book. Don't spend too much time in conventional flying unless it is one of the requirements. In this case, of course, you will have to do as directed. Also you should not do it until you are a reasonable master of smooth flying. Best luck,

Larry Callahan

(Continued on next Page)

Dear Bud,

I asked the General to write you a note and comment on my advice. He showed the letter to the others. Who are they? General Hunter—"Monk," as you know him, in his day was a great fighter pilot. Now commands the 8th Fighter Command very ably. Was credited with nine Boche in the last war. Won the DSC with four Oak Leaf Clusters and the Croix de Guerre and Palm.

Callahan (Lieut. Col. Lawrence K. Callahan)—If you have ever read "War Birds" you will know him. If you haven't—read it! He was Billy Bishop's wing man in the last war and helped Bishop



run up his score of 76 Boche. Callahan has the British DFC and our Silver Star and two Oak Leaf Clusters.

Seerley (Major)—An old-timer from the 13th Pursuit Squadron. My wing man until he got a flight of his own. Was credited with five Boche.

Pete (Lieut. Col. Chesley G. Peterson)—Is the leading ace of the Eagle Squadrons. Transferred to the U. S. Army Air Forces. He has eight destroyed Boche, five probables and seven damaged. Has been awarded the British DSO, DFC and recommended for our DSC.

Comment from these men is worth a lot. Take it to heart and pass it to your friends if you think worthwhile.

Dad ☆



A B-17 flies about ten miles to the left of a thunderhead formation (cumulonimbus capillatus) over the Northern Solomons in the Southwest Pacific. Clouds like those in the foreground (altocumulus castellatus) mature into thunderheads in about two hours.

## **B E W A R E**

# **THE PACIFIC THUNDERHEAD**

By LT. COL. JAMES CONNALLY

**W**HEN you take off for the Pacific or Southwest Pacific, leave behind all your previous ideas about penetrating weather fronts.

All existing plans and procedures are based on the maintenance of a definite course, altitude, speed, and so forth. This, I know from experience, cannot be done in the Pacific thunderstorm areas. For storms in the vicinity of the equator are generally far more violent than those found in the United States. If you attempt to hold a definite course and altitude and fly headlong into some of those severe thunderheads, you will be inviting suicide. On the other hand, a slight deviation may allow you to avoid a thunderhead completely.

The thing always to remember in the Pacific is that no set plan can be established for taking a formation through a front dominated by thunderstorms.

This does not mean you can't get through. Frequently, thunderstorm areas can be penetrated by placing the formation in a column of elements and having an experienced leader pick his way around and between thunderheads. He will select "light" spots in the clouds and occasionally fly on instruments for a minute or two with his wing men in close.

Succeeding elements may lose the lead element for short intervals but you can usually pick it up again when emerging from areas of poor visibility.

This method may be used very effectively at times over water by flying 100 to 200 feet or less above the surface. While areas of heavy rain may be encountered, thunderstorms are generally less violent at this altitude.

Another technique in flying at a 100-foot altitude over water is to employ a shallow echelon (well forward), with

**Tropical storm areas can be penetrated—but you had better know how before trying it.**

about a two-mile interval between planes. In rain areas individual planes will temporarily lose sight of other planes but can hold their course and possibly remain "contact" by looking out of the side window (on B-17s). Or they may have to pull up to 300 to 500 feet and fly entirely on instruments for short periods.

While the successful penetration of a front dominated by thunderstorms usually will depend more on the leader "picking holes" than upon anything else, sometimes this will be impossible. Then, planes may be able to make it through the front individually and rendezvous at a predetermined point on the other side of the front. In many cases, the formation may have to abandon the flight and return to base.

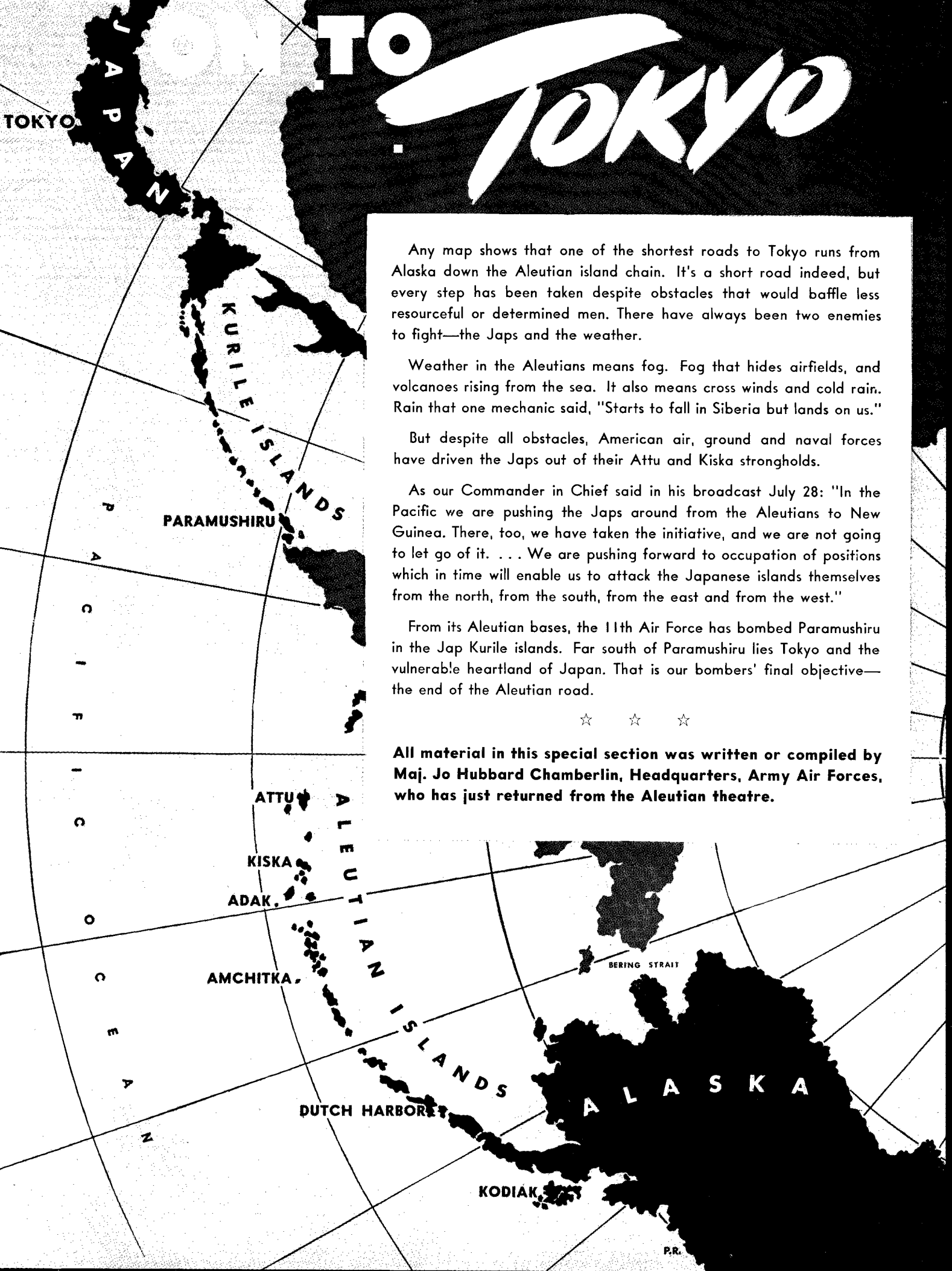
Above all, never get the idea that any airplane now built can go over the top of all thunderstorms. In some tropical areas, a storm having a top of only 25,000 feet is hardly considered a thunderstorm.

An individual plane can often penetrate these fronts in a similar manner—by flying low over the water and "picking holes." In rain squalls you can usually stay "contact" by looking out the side window. Where visibility gets too bad and you must go on instruments, go up to about 500 feet until you break out.

Of course, the only time a single airplane should be required to fly through such a front is in case of ordinary travel, or when returning from a mission, or when on reconnaissance patrol. En route to a target the formation should be together for mutual protection. It would be unwise to send planes through a thunderhead individually, even though it could be done, unless the target justifies such tactics. ☆



# ON TO TOKYO



Any map shows that one of the shortest roads to Tokyo runs from Alaska down the Aleutian island chain. It's a short road indeed, but every step has been taken despite obstacles that would baffle less resourceful or determined men. There have always been two enemies to fight—the Japs and the weather.

Weather in the Aleutians means fog. Fog that hides airfields, and volcanoes rising from the sea. It also means cross winds and cold rain. Rain that one mechanic said, "Starts to fall in Siberia but lands on us."

But despite all obstacles, American air, ground and naval forces have driven the Japs out of their Attu and Kiska strongholds.

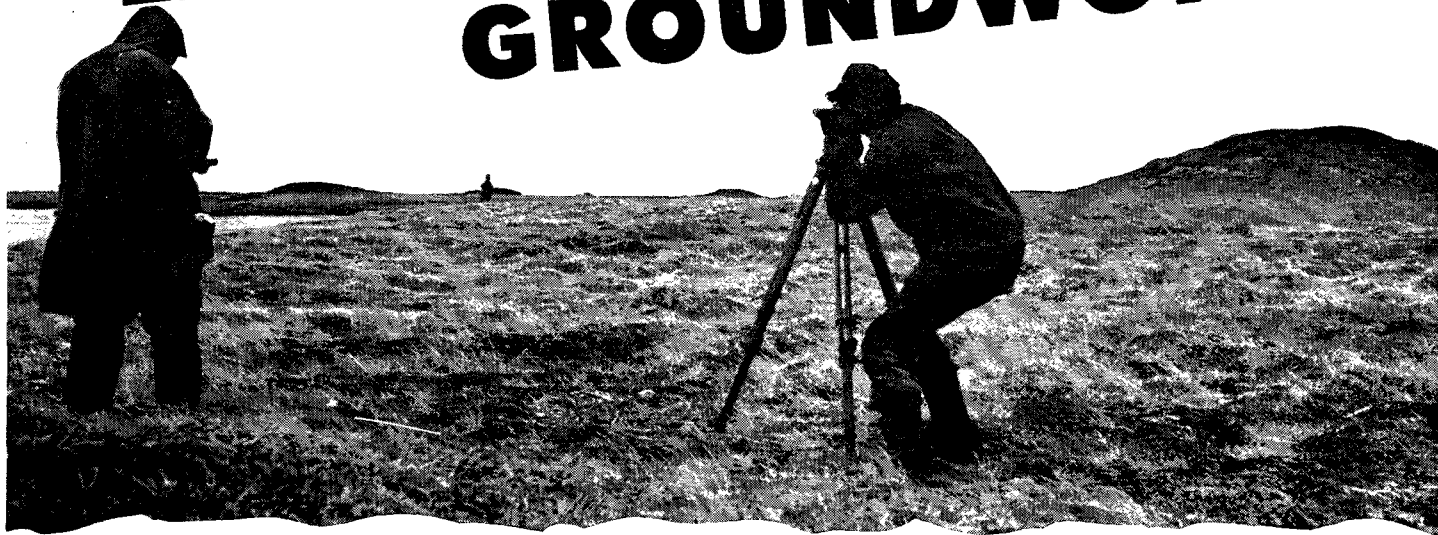
As our Commander in Chief said in his broadcast July 28: "In the Pacific we are pushing the Japs around from the Aleutians to New Guinea. There, too, we have taken the initiative, and we are not going to let go of it. . . . We are pushing forward to occupation of positions which in time will enable us to attack the Japanese islands themselves from the north, from the south, from the east and from the west."

From its Aleutian bases, the 11th Air Force has bombed Paramushiru in the Jap Kurile islands. Far south of Paramushiru lies Tokyo and the vulnerable heartland of Japan. That is our bombers' final objective—the end of the Aleutian road.



All material in this special section was written or compiled by Maj. Jo Hubbard Chamberlin, Headquarters, Army Air Forces, who has just returned from the Aleutian theatre.

# LAYING THE GROUNDWORK



ONE by one, American airbases have been built in the Aleutians despite enormous problems of terrain, weather and supply. These bases have stopped Jap aggression in this area, and they now provide means for our offensive operations.

Nine months ago, Amchitka was a desolate island. Today it is a well-protected, well-equipped airbase, just 85 miles from Kiska and some 750 miles from the northernmost Kurile Islands—the nearest Jap territory. It is one of many stepping stones to Nippon. The difficulties our men overcame to build it are typical of all Aleutian operations. Our troops landed there in a storm on January 13, 1943. Two more storms occurred during the month. Only a reconnaissance party had preceded them to the island. This party had made a quick survey, for time was vital. The Japs had looked the island over, too, preparatory to moving in.

Among the first ashore were aviation engineers, under Col. L. H. Foote. They helped build roads and a dock as well as runways. Col. F. S. Blinn was resident engineer. Col. John Sullivan came later with another battalion of engineers and the combined units started work at once.

Snow fell. The muck was up to your shoetops. Tents were erected and loose boards put down for floors. Candles furnished light. Coal for tent stoves had to be packed by the men on their backs.

All equipment had to be unloaded from ships into barges and the barges unloaded on the beach at high tide. Getting heavy trucks, caterpillar tractors, trailers, scrapers and other machinery ashore through the surf was a real problem. Roads were built over tundra and muck. Land was drained. All roads must have a high crown so that the heavy Aleutian rains drain off. A hard surface of sand, crushed

## Our rapid airbase construction has been a major factor in our Aleutian offensive.

rock or both must be provided to stand heavy traffic.

A frozen lake was located where the fighter strip was to be. The lake was drained but instead of a firm sandy bottom there was silty muck. By exploration a sand deposit was located and the sand dug out, hauled and dumped into the lake bed. To make the runway firmer, it was raised two feet above the original estimate. As much sand was hauled to furnish hardstandings for dispersal areas as was used on the runway.

A mess truck made the rounds of workers in the field with hot food and

drink. To keep the trucks and other earth-working machinery rolling, mechanics put "duck boards" down in the mud and lay on their backs to make repairs. The Japs attacked Amchitka and several lives were lost in bombing raids.

Nevertheless, the field was ready, *on schedule*.

DESPITE weeks of gruelling labor, the engineers stayed up all night to cheer the first fighter planes in, on February 16.

Two days later, the Japs sent two float Zeros over from Kiska on reconnaissance. American fighters, waiting high in the sky, shot them both down. The engineers' labor had paid quick dividends.

Meanwhile, work had been proceeding on a bomber runway. At the earliest possible date, the heavy bombers wanted to blast the Japs on Kiska from this base less than 100 miles from the enemy-held island. So 24 hours a day the work went on, with the big machines carrying sand from the pits to the runway site. It, too, had lakes to be filled in.

Other preparations had to be made before planes could fly. The ground echelon of a heavy bomber outfit came to Amchitka on April 20. Its job was to erect tents, construct a mess hall, establish communications and get gasoline, oil and bombs ready for use. The men wore high boots. The airbase commander, Col. A. E. Hebert, was among those who went up in muck to his hips. Most of the difficulties were due to the tundra—a soft spongy layer of earth and moss, from three to twelve feet in thickness, which soaks up water in summer, often freezes solid in winter and is very unstable.

A young second lieutenant, Virgil Watson, of Cincinnati, Ohio, found himself responsible for this particular work al-

## MOSQUITOS ALASKAN STYLE

The flight characteristics of Alaskan mosquitos have been greatly exaggerated. It is not true that they peel off, dive on you and flip your dog tags over to ascertain your blood type before striking. There has been only one proved instance of this. They are not as large as vultures. They are only as big as an Arkansas hen—very small but very tough. The Department of Agriculture crossbred the Alaskan mosquito with a small-bone turkey, to reduce their belligerence and provide an edible fowl, but the mosquito strain was dominant and the experiment was abandoned.

It does no good to use screens on barracks because one small, wiry mosquito is pushed through the mesh by the bunch, and then he pulls the others through. It is not true that anti-aircraft outfits fresh from the States have opened fire on them, thinking they were Zeros. Their tail assemblage is entirely different.

though he was a communications officer. He was 25 years old and had been in the Army just six months. Handling engineering matters later on was Lieut. Jerome C. Goodman. Lieutenant Watson brought twelve men to begin the job. His first task was to prepare tents and living quarters for sixty additional men who were on the way in a ship with 600 tons of supplies. Later thirty more men arrived, so the radio officer found himself a construction boss with 100 men.

A road leading to the bomber strip went but a short distance uphill. From then on men had to transport their supplies over tundra, bogs, lakes and muck. As the caterpillar tractors available were being used on the runway in the daytime, the ground echelon had to borrow them for use at night to haul their supplies from the beach to the area that had been set aside for the bomber command.

The going was so rough that a caterpillar tractor was used to pull a trailer, which also had caterpillar treads. This team was followed by another tractor

which would pull them out when stuck. Sometimes all three vehicles would get stuck -- even though a soldier plodded ahead of them to pick out the best way. So Lieutenant Watson had some sledges made which didn't bog down in muck when the cats did.

Rain fell. The men were soaked. An Army physician said that he treated enough first aid cases among the 100 men for a whole regiment--bruises, cuts and pulled tendons from slogging through

mud. Weights up to 2,000 pounds were carried on the shoulders of as many men as were able to get round the box and lift it.

In a brief ten days the ground echelon had scraped out locations for tents for officers and men, going down through the tundra to hard rock. The men erected mess halls and pyramid tents and built tables to eat on. They put up quarters for officers and men, drew coal, lugged it on their backs and had it all ready for use. They hauled bombs, gasoline and oil where they would be available for an immediate combat mission. The air and ground crews, had only to move in and go to work.

And here's the payoff:

On May 3 the B-24s came to Amchitka at 1000 o'clock. Crew members put their baggage down on the hardstandings near the runway and ate a hot meal that was ready for them. Their planes were serviced and they took off on a successful bombing mission against the Japs *the same afternoon.* ☆

**The pay-off: The first fighter plane lands on the runway at Amchitka. Next day, two surprised Japs were shot down.**

## ON TO TOKYO

### 'Enough to Make a Demon Cry'

In the Aleutians, American forces built many airbases while the Japs struggled to build two—one on Kiska and one on Attu. On Attu the Japs had been trying to complete a fighter strip for four months. Eight days after American troops had landed, we had a fighter strip in operation.

The Japs not only lacked American engineering experience and skill, but our fighters and bombers subjected the Japs and their machinery to continual strafing and bombing. That such attacks were successful is evidenced by notations in the diaries of dead Japs on Attu:

"When one looks at a place that was bombed, it looks as if it had been turned inside out."

"Because the enemy planes come each day, the soldiers are tired out and have no energy."

"These strafing attacks by American fighter planes are enough to make a demon cry."

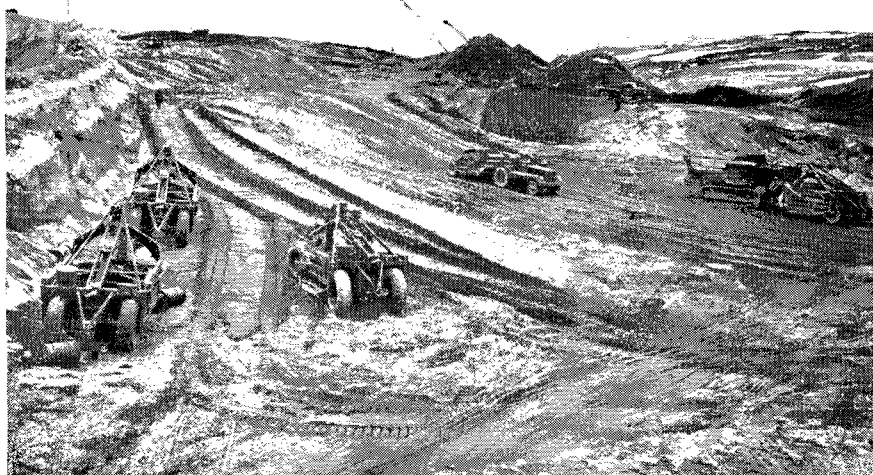
**A runway crosses a large creek. The heavy rains on Amchitka require large-capacity drainage facilities.**



**Below is shown just one section of the huge sand pits which were dug to get sand for fighter and bomber strips.**



**Sand is hauled by truck from big pits to build foundations for the runways and dispersal areas.**



# HOLD YOUR HATS

## A B-25 mission runs into some close calls in blowing up a Jap fuel dump on Kiska

**T**HIS medium bombardment mission was planned by the men who took part in it on March 30, 1943. While the pilots had been flying in the Aleutians for some time, most of the co-pilots and bombardiers were on their first mission. They were due for some surprises.

Six B-25s hoped to catch Kiska unawares. The planes skirted sixty miles to the west of the island and then came in, facing a mountain. They split up in three elements of two planes each.

"A" element flew to the left of the 1,300-foot mountain. Elements "B" and "C" flew to the right of it. "C" flew up a ravine.

"A" element consisted of planes piloted by Lieut. William B. Jackson of Carbon, Texas, and Lieut. William E. Geyser of Anchorage, Alaska. They attacked a radio station and fighter strip. "B" element, headed by Lieut. George A. Barber of Lubbock, Texas, and Lieut. William Candy of Braintree, Mass., attacked the main camp. "C" element's planes were piloted by Lieut. Ray Stoltzmann of Marshfield, Wis., and Lieut. Everett Henricksen of Chicago.

STOLTZMANN has been in the Army eight years, rising from an enlisted infantryman to flying officer. He is quiet-spoken, with courage to spare. Henricksen is light-haired and stocky. He used to fly as a hobby before joining the Army. He was an accountant for a real estate firm.

Stoltzmann was leading "C" element and right behind him was Henricksen's plane. They roared up the ravine to the right of the mountain and dove down the other side of the "saddle," as the central, narrow part of Kiska is called. The Japs were firing their anti-aircraft and machine guns. Stoltzmann dropped his bombs, which had delayed fuzes, but unfortunately the bombs went off instantaneously. They blew up a Jap oil storage installation—but they also gave Henricksen, 300 feet behind Stoltzmann, the benefit of their full blast.

A bomb fragment smashed the glass in front of Henricksen and cut his arm. His B-25's wing was blown out of line, and riddled with holes, but he skillfully kept the plane under control. At the time of the blast, Henricksen's bomb bay had been open and the bombardier had been about to release his bombs. The blast jammed them. One 500-pounder was caught vertically, making it impossible to

close the bomb bay doors and placing the crew in a potential position of being blown to bits should the bomb be struck a sharp blow.

LIEUT. ARTHUR HORN, the bombardier, squirmed down into the bomb bay, after slipping off his parachute due to the narrow space. He first removed the fuze. There is no catwalk in the B-25; he had to hang on with his fingers and wrestle with the bomb for fifteen minutes before he could get it free. Then down it fell. He then worked two 300-pound bombs back on their racks and climbed back to safety.

Five of the six planes met at the rendezvous, and four of them were damaged. Geyser in the sixth plane was having *his* troubles. His controls for throttle, propeller pitch and mix had been shot away. But the engine, in such a situation, assumes a fast cruising speed. So Geyser flew his B-25 back to base, and although he could not get his damaged wheels down, he made a successful belly landing.

From information gained later, we learned that the Japs lost a great amount of oil on this raid, so the troubles endured were more than worthwhile. The War Department thought so, too, and awarded DFCs and Air Medals. ☆

### KISKA MISSION

By Capt. James C. Beardsley, Navigator

We headed westward with a cargo of death  
We flew far West on the wind's wet breath.  
A thousand miles of engine roar  
Ere, shadowlike, we saw the shore—  
A baseboard to a wall of mist.

The flash of cannon was our welcoming sign;  
The sound of their shells, and the bullets' whine;  
Presenting a glimpse of man-made hell,  
Of death amid the battle yell—  
A holocaust of fire and flames.

Our vengeful fingers stoked smoking guns.  
Down dropped our bombs in whistling tons,  
Missiles of death, of fire and hate,  
Destruction most articulate.  
We burned and maimed and slew.

Up into a cloud we climbed for cover.  
Our bomb-load gone, we must get another.  
Already, while we plan *tomorrow's* raid,  
The isles behind us fade  
To turgid mist and sea-stained stone.



**I**N Alaska you can stand in the mud, have dust blow in your eyes, be within six feet of a snowbank and yet perspire like the devil. There's no land like it on the globe.

**SPORTSMAN'S HEAVEN.** The military garrisons in the interior of Alaska are isolated, and manufacture their own entertainment. They enjoy hunting and fishing. One airbase I visited served up barbecued bear meat. It was delicious. Another outfit caught 600 pounds of trout in one afternoon. Fish bite in Alaskan streams as they never do at home, and the woods are full of game.

At another airbase, pilots fresh from the States are often told by the control tower that they will have to circle around for ten minutes before landing to allow time for a soldier to hop in a jeep and shoo bears off the runways.

**MAIL.** Men in the Aleutians receive strange gifts through the mail. As any soldier knows, spam or luncheon meat appears on mess tables with disturbing frequency, and yet one officer received a can of it from his wife—as a birthday gift. Another man got a can of tuna fish, also on the menu far too frequently. A tough crew chief received, for no ascertainable reason, an application blank to join the WACS.

One day an intelligence officer, Capt. Phil Orcutt, was sitting in his quonset hut, going through his mail, while outside the rain fell and the wind blew. He opened a form letter from a well-known national magazine, which began as follows: "As this letter reaches you, you are, no doubt, sitting on the porch of your summer cottage, or perhaps you are seated on the deck of your yacht, thinking about the fine job our boys are doing overseas. . . ."

**TALE.** There are no cows in most parts of Alaska. A woman was going to have a baby, so a cow was actually flown in by transport plane. Unfortunately the cow went dry. So a friend hundreds of miles away flew up a bull to mend matters. Meantime, however, the cow had been flown south with the same objective in mind. So, there they were, 1,000 miles apart, and that's where they stayed.

**COOPERATION.** One does not have to be in the Aleutians long to see that Army and Navy cooperation is of a high degree. To mention a few examples:

1. Both services exchange motion picture films.
2. Navy ships stores and Army Post Exchanges sell to all service men.
3. On many missions both Army and Navy planes participate. The Navy sends out a PBY rescue plane which has saved many AAF lives.
4. Navy PBYs patrol the ocean and re-

port results of AAF attacks, mainly on Jap shipping.

5. The exchange of intelligence and other vital information.

6. Some items of Navy clothing that are especially good for this theatre are purchased by Army men, and vice versa.

7. Active social relationships are maintained between Army and Navy personnel. Motion pictures, candy, tobacco and poker are enjoyed equally by both branches. At last report, the Army was ahead in poker winnings—but by the scantiest of margins.

**HOW TO SLEEP.** Men sleep on the cowl of a jeep, on the seat of a bulldozer, leaning against a tree, or lying on the ground, but in a transport plane it's tough. I noticed that one old hand opened up the lid of a tool chest and slept soundly on the hardware stowed in it, with his feet dangling over the end.

Transport planes have side seats consisting of a series of aluminum pans, designed to hold the seat cushions of chutes. Sleeping on these seats is like sleeping in seven buckets, but it can be done. The best plan is to lie on the floor with a flight bag for a pillow. It sleeps fine if you are tired enough.

## THERE'S NO LAND LIKE IT

**RUGGED LIFE.** It is difficult to realize, viewing some of the Aleutian bases today, that they were built and used in earlier months, under the most rigorous of conditions. Men lived in tents with no floors. There were no lights and C-rations were used for months. At one island base the coal was limited to five pounds per man until a shortage was made up. The men just crawled into their sleeping bags after work in order to keep warm.

**HORRORS OF WAR.** Getting on our plane at an airbase near the Arctic circle was a sun-tanned young civilian, dressed in cotton slacks, cotton shirt, light polo coat and low tan shoes. He had been grounded at this chilly base for a week. A resident of Arizona, he had been ordered to report for civilian war work in Alaska immediately, so he had come ahead—without the opportunity of drawing arctic clothes. He hoped, he said shivering, to draw woolens soon.

**MAN'S LAND.** A USO show came to town with some girls in it. One of the

pilots, a Lieutenant Mullins, knew one of the girls and, through this contact, invited them over to the hut after the show. The boys cleaned the hut up for the first time in months; they were shaved and slicked up—only to have the girls telephone at the last minute and say the General had asked them over so they couldn't come.

Lieutenant Mullins later had two dates with his friend in the show, to the envy of the other pilots. The Flight Surgeon moaned, "Twenty-thousand men on this island and she asks for Mullins." However, Mullins let the FS eat supper with them—and then shooed him away.

When this particular outfit first came into the area, the men brought in crates of fresh eggs, hams and fruit. One chap who brought in two bottles of Coca Cola sold one for \$30 and was about to sell the other one, when he decided that if it was worth that much, he would drink it himself—and did. It isn't that scarce now, but it's still not common.

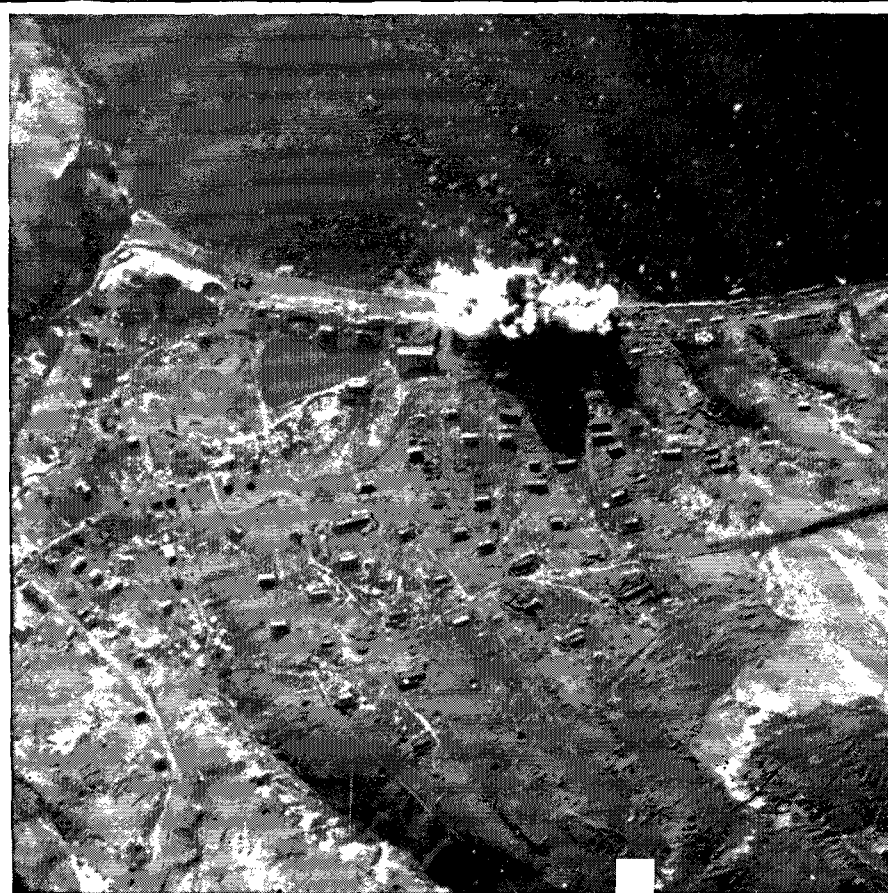
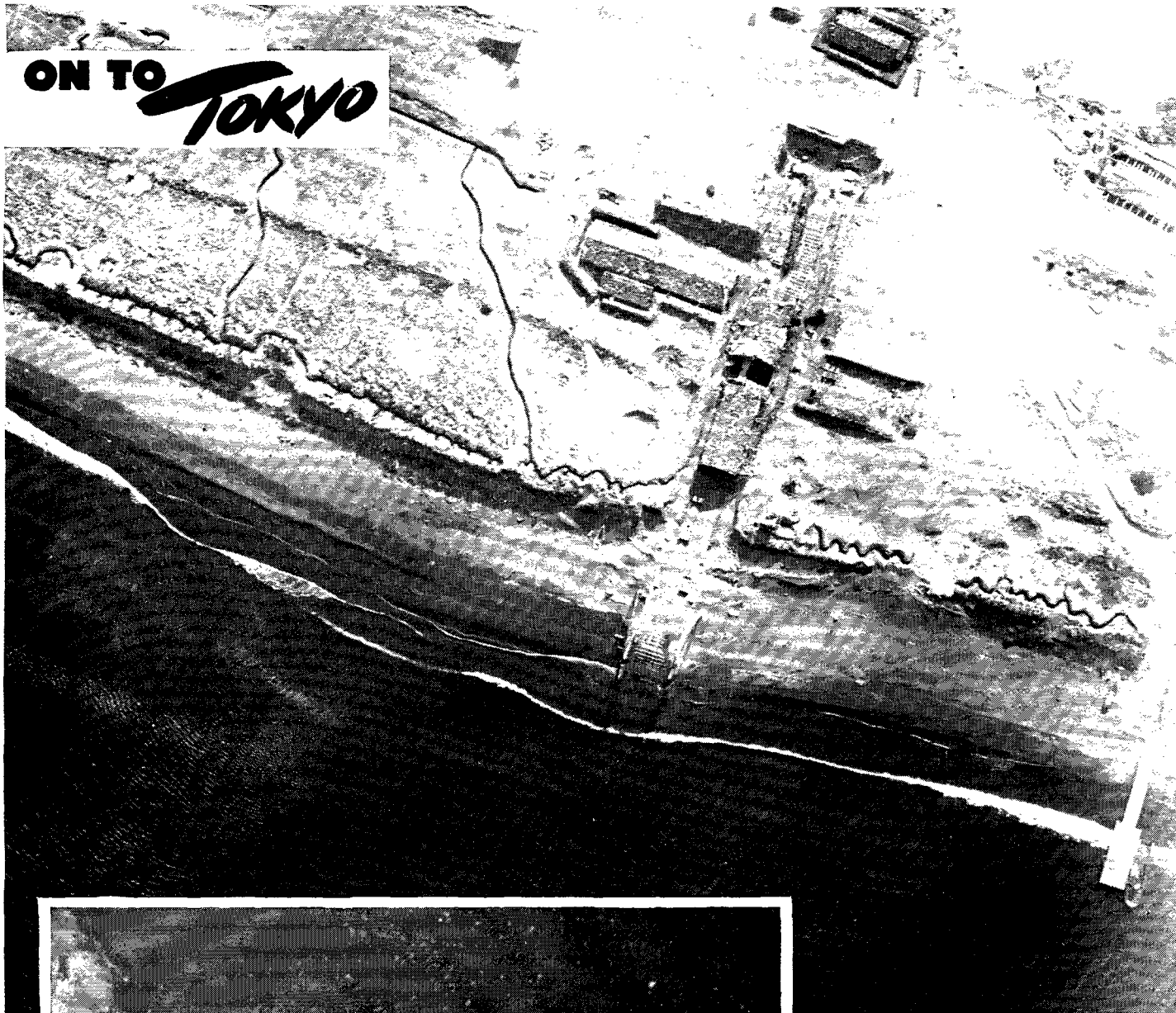
**CONTEST.** I played center field in a softball game. Our team lost, 32 to 4. It took me a little while to get used to the Aleutian style of play. Nobody except myself paid any attention to the rain, to the 30-mile-an-hour breeze which blew fly balls in two directions, or to the Simmons-soft tundra which gave the ball a terrific bounce. Till I got the hang of it, I almost went crazy—and so did the team.

**PLUMBING.** In one quonset hut, the boys had fixed up a drum of cold water on a platform, which fed into a tank on the stove, thence to a sink, and from there out a drain—all made from hydraulic lines out of junked airplanes.

**WILD BLUE YONDER.** I have had some strange experiences but I never expected to buzz moose in a nine-man glider. We took off, towed by a C-47 at 160 mph, and went hedge-hopping across the tundra and flats, just clearing the tree tops. We skimmed the hills and swooped down into the valleys, looking for moose. We spotted a herd of deer. Then, not far from the foot of a glacier, we saw a moose splashing out of the water, frightened by the plane. We had to turn around in a high, narrow valley near the Manataska, and for a moment I thought we would have to release our glider and land in the timber. However, the pilot sweated out the sharp 180-degree turn, and we headed back to the field.

**SQUIB.** There are no trees in the far Aleutians. Not long ago there was a story in American newspapers that the pilots at Umnak had flown in a single tree, planted it and labeled it "Umnak National Forest." The news item neglected to mention *why* the tree had been flown in—for the exclusive use of a flyer's pet dog.

# ON TO *TOKYO*



Precision bombing pays dividends in the Aleutians. The Japs built huge revetments, but it was no use. Photo above shows a submarine base on Kiska harbor that AAF bombs have blown apart. One damaged midget sub is still on the ways. The wavy black lines along the beach are trenches.

☆ ☆ ☆

At left, a bombardier drops his eggs just where he wants them—on docks and float Zeros. All Zeros were later destroyed.

☆ ☆ ☆

At right, an oblique view of Kiska harbor on an unusually clear day. Salmon lagoon is in the central foreground. Heavily defended North Head lies between Salmon lagoon and Kiska harbor. Jap fighter strip is beyond the lagoon. Two beached ships that AAF planes have destroyed can be seen; more lie beneath the waves.

**I**T was pitch black, as I felt my way around the tent in search of my pants. I was eager to get outside to see how the weather was going to be. We had landed at Adak just a few hours before, and now we were making our first raid. Outside, I gazed at the sky and no stars were to be seen. The wind was cold. A faint light showed that there were clouds hanging in the harbor. Was this good or bad? I couldn't decide for sleep was still full in my eyes. I would rather have Japs shoot at us than to climb through an overcast with forty other planes.

After bolting a few flapjacks, we hurried to the plane and awaited take-off orders. At 0700 our engines were running and by 0800 we were all in the air, starting for Kiska. There were P-39s on our port side and P-38s on our starboard, with B-24s in between.

The ceiling was 1,000 feet with occasional skud down to the water. This we skirted to keep the peashooters in contact with us.

As we rounded Segula Island we stayed low to the water. Col. W. O. Eareckson with his two wingmen were in front. Major Watt and his flight were slightly higher and to the left. Major Watson was higher and to the right, followed by Captain Smith and his flight, which was low and behind Major Watt. About fifteen miles out the signal came for more power, and each of us jumped as if he had been shot. The pursuits dropped their belly tanks and surged forward just above the water. About four miles from the target we were flying with our throttles nearly wide open.

## **Softening up for capture means many a heavy bomber pounding such as this.**

We were about four miles from Kiska's North Head when I saw firing off that point. There were two large guns and they were following us up nicely. One shell hit directly below our ship, throwing a huge geyser of water that nearly touched our belly. The burst destroyed two of our radio antennae. Little Kiska opened up but I couldn't see what fire-power was there since we passed to the right of the Head. The leading P-39 dived on one large gun emplacement, silencing it with a single burst.

Our top gun turret opened up with a terrific noise. It seemed to me as though it was firing right between the pilot's

seat and my own. The cross fire from Little Kiska, North Head, and South Head seemed impenetrable, and ships anchored in the harbor were throwing a large amount of fire.

Just before we reached the Head, a Jap machine gun sprayed the water in front of us. Lieutenant Lockhart opened up with his front side gun, and the firing quit before we came to it. Lieutenant Lockhart was not sure that he hit the emplacement but was sure that he had scattered the personnel.

**COLONEL EARECKSON** was a hundred yards ahead of us as we came into the mouth of the harbor. Because of the angle of our approach, we had to make a dangerously steep formation turn close to the north cliff to stay on the right side of the harbor and hit our objective. The bay is small and by the time we had rolled out of our turn, we were almost to the camp area—our target.

The large transport in the middle of the bay was my greatest worry, since we flew directly over it. On the bow there was a large gun, with several machine guns on the decks. Every one of our gunners who could see the ship strafed it from one end to the other. Our port side gunner gave it a burst, and the tail-gunner said he raked it from stem to stern twice and almost blew the bridge apart with a long burst.

At this point the fire from the right side of the harbor seemed to diminish. I think we were so low that it was hard for the Japs to bring their guns to bear on us. We received a hit in the starboard

### **The Japs' Best Friend**

**I**n the Aleutians, the weather has been the enemy's strongest ally. Fog which lasts for days made it impossible for us to gain the cumulative results of day-after-day bombing, and it permitted the Japs to rebuild.

On Kiska the enemy constructed huge earth revetments around each building and installation, so that bombs had to be dropped with pin-point accuracy, despite heavy anti-aircraft fire and poor visibility.

But month in and month out, whenever planes could fly, our men took off in fighters and bombers to attack the enemy. This narrative by Captain Waddlington describes a typical heavy bomber mission of the kind that struck the Japs down . . . and out.

# **SURPRISE RAID ON KISKA**

**By CAPT. IRVING L. WADDLINGTON**



wing, next to the number four engine, that entered from the top. Either we received this while in our steep turn or from somewhere along the top of North Head. We also received hits from below, behind and to the left. One went through the glass door, barely missing the side gunner, and another penetrated the right rudder.

A float Zero took off the water on the course we were making. He pulled up immediately in the most "straight-up" climb that I have ever seen. Two or three top gun turrets turned on him; then two P-38s blew him apart.

The camp area was directly ahead of us. The tents were very close to one another, in line with buildings in the rear and about 200 yards from the beach. A small dock and several shacks were located on the beach. Bombardier Lamberth's first bomb hit next to the dock, going through a row boat that was tied to it, and the rest of his bombs were evenly distributed over the area.

Our engineer Technical Sergeant Sahroian was operating the bomb bay doors, so he had a bird's-eye view. One demolition bomb hit and took a whole row of tents with it as it bounced along the hard earth. An incendiary struck a building that resembled a mess hall and immediately covered the roof with fire.

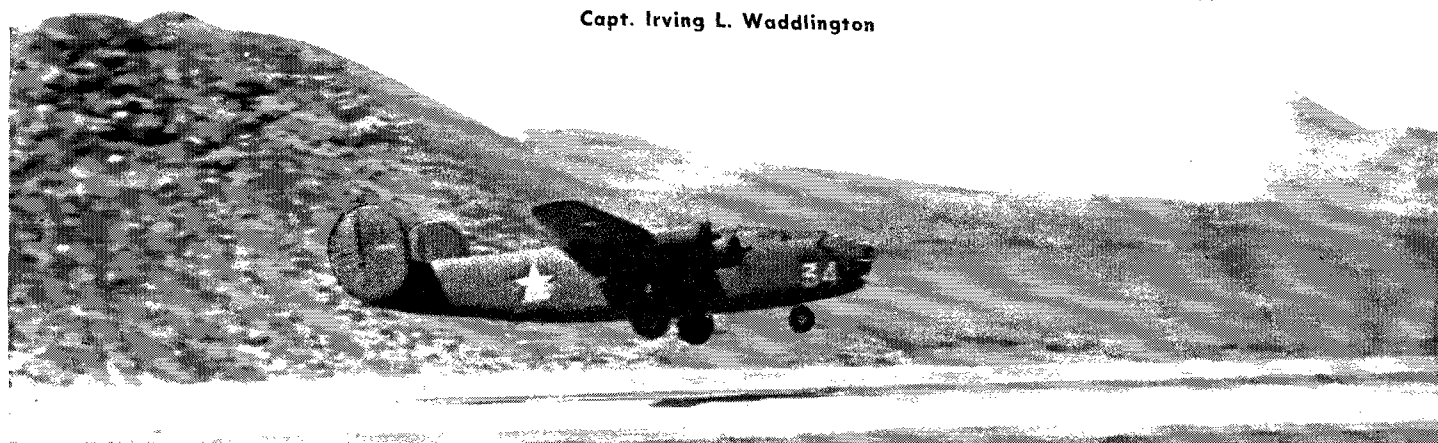
We climbed gradually up the slight rise ahead of us so we could cut through a small valley and out the other side. As we climbed we must have been the only bomber in sight of the south side for Jap tracers were following us. We saw machine gun emplacements on our left. We could see men scurrying up zig-zig paths to the guns as we neared them but they fell flat when they saw us heading toward them.



Capt. Irving L. Waddlington

There were several P-38s circling over the water as we came out the other side of Kiska Island. After we had turned right and started around the north tip of the island, anti-aircraft guns opened up so we veered to the left and out of range. They, however, were shooting at the P-38s, not us. We then saw a B-17 picking up our fighter planes and we circled, waiting for the rest of our flight to rendezvous. One of our gunners saw two of our pursuits on the tail of a Zero collide and fall into the water.

I checked our crew to see if each man was all right and to determine the extent of our damage. We checked in by radio with our flight and they all answered. Large columns of smoke were rising from the harbor as we turned our backs and headed for home. ☆



A B-24 takes off to bomb the Japs.

Not only have the American soldiers been affected by life in the Aleutians, but life in the Aleutians has been greatly affected by American soldiers. Take, for instance, the raven of the western Aleutians, *kiwi arcturus*. These islands have been his habitat for centuries. Larger than the ravens commonly seen in the United States, he is a rugged bird, hardened to life on the chill, tree-less slopes, and accustomed by hard experience to scratching out a living. A few ice worms and glacier snakes—when he can get them—constitute his diet. He is, understandably enough, not of a happy-go-lucky temperament but he is alert, imitative and quick to make up in intelligence what he lacks in charm.

But since the Americans have come to the Aleutians, there has been a complete breakdown in the raven's life cycle.

First indication of this came in the fall of 1942 when a fighter pilot observed a string of ravens flying alongside his ship, and they were doing, whenever he did, slow rolls and snap rolls. The ravens were awkward at first, but soon they were executing these maneuvers with such precision and fluidity that the pilot decided he'd show these birds something. He turned the show into a rat-race, hedge-hopping and buzzing the field, but to the

## MAN AGAINST NATURE

pilot's chagrin, the ravens not only could do the job better, but one raven flew alongside carrying a small piece of a sergeant's ear that he had nipped out while this GI had been standing agape on the field watching the show. The disgusted pilot gave up and landed his ship.

To his amazement, all ravens followed him in, peeling off and setting themselves down like hot pilots, without even bothering to let down their flaps, and stalked off to their own "line" along a lagoon. An intelligence officer, who happened to be hidden while fishing behind a sandbank, was able to verify the recent report that these ravens were now talking among themselves with a Texas drawl. They had been jamming the radios of a Texas bombing outfit, which had reported in to the base four weeks before, and picked up the lingo.

An anti-aircraft gunner recently pleaded in vain for permission to put a burst or two in a particular flight of the birds.

He pointed to a triple, twelve-bird formation, winging steadily along in best B-24 style on a course of 270 degrees true, "The othuhs is tryin' to be fightuh

pilots, but them so-and-sos ovah theah, ha' been bombin' us all mornin'."

The effect of military tactics on the ravens is not as great as the adverse effect on raven home life. Whereas they used to forage for their own food, they now hover lazily over the cook houses, waiting for a KP to come out with a load of slop, and then they follow him to the garbage burial hole.

Older parent ravens are unable to persuade their young ones that someday the Americans will be gone, this picnic will be over, and they will have forgotten how to earn a living on these chill shores. But the young ravens dismiss such talk as old fogeyism. Too lazy and fat to fly, with full stomachs they now *walk* behind the KPs to the garbage dumps and search for fermented foods and fruit juices hoping to get drunk. One Saturday night the heart of every man in camp was touched at the sight of one old father raven, out looking for his wife and sons who were "on the town." He found them deep in their cups and had to take them home and put them to bed—dead drunk.

"It sho' does come hahd," he said to himself, and then cursed softly, realizing that he too was speaking Texan and not the pure Aleut his raven ancestors had used since the last ice age. ☆



# THE FIGHTERS POUR IT ON



**Before: An American patrol plane spots float Zeros on the beach at Attu, tossed about by a storm.**



**After: American fighter planes strafe the Zeros, destroy every one.**

**"E**NEMY planes flew over today. Their object was to play havoc with our strong reconnaissance and with our spirits."

"Most fighter planes executed dive-bombing with lightly loaded bombs, and we had comparatively great losses."

"At first the enemy used time fuzes which exploded in three minutes, but later the enemy used fuzes which exploded one to two hours after dropping. They gave us spiritual fear and labor delays."

"Twenty casualties occurred this week among the —AA Battery as a result of strafing fighters. The appearance of being shot by machine guns repeatedly, by seven or eight planes, is very mortifying; we just grit our teeth because we cannot do anything about it."

Thus have the Japs themselves recorded the effectiveness of American fighter operations in the Aleutians, and both airmen and ground crews share the credit.

Our fighters have protected our bombers in their attacks on Kiska and Attu, and proved the value of combined operations. They have shot Zeros out of the sky. They have flown reconnaissance and patrol. They have strafed and dropped bombs themselves. When our bombers were roaring over Kiska, our fighter planes preceded the B-25s and B-24s, machine-gunning anti-aircraft installations and helping thereby to save lives by diminishing AA fire. Kiska had seventeen separate gun batteries. Without the fighters to precede them, many bombers would doubtless have been lost.

Our fast P-38s have been especially successful in such operations. In the early days of the Aleutian campaign, our bombers had to fly long distances to attack the Japs—beyond fighter range. But as

soon as we had bases in the Andreanofs, less than 100 miles from Kiska, our fighters really did their offensive stuff. P-40s and the P-38s would dive right down the AA gun barrels. They silenced the gun crews or drove them into their foxholes. And from their nearby bases, the fighter planes could fly many more missions per day. While weather in this area would not permit flying every day, repeated missions on the same day gave the Japs no letup.

It's no easy trick to land a high-performance plane on an Aleutian strip in a stiff cross wind. Runways in the Aleutians are often built on the only flat land available, which means: Look out for nearby hills or peaks. The fighter pilots had more, perhaps, to fear from fog closing in on their airfields while they were out on a mission, than the bomber pilots, who had larger gasoline loads. As rapidly as possible, airfields and auxiliary bases have been built, so that if one island is closed in the planes can reach another. But fighter pilots still have their problems.

Not long ago a P-38 mission took off to strafe Kiska. Fog blanketed their home base. Several men flew to another base and managed to land through a "hole" in the soup. One pilot, with his gas running out, elected to land on the water, but he was seriously injured while doing it and was drowned. Another P-38 pilot landed in the water of a lake on a nearby island which was clear of fog. He climbed out of his peashooter before it sank, swam 150 yards to some rocks and waited there

for rescue. A Navy PBY had to land on the sea, three miles from the lake. The PBY crew carried a rubber life raft to the lake, launched it and rescued the pilot.

The line crews have done a splendid job in keeping a high percentage of planes in the air. Maj. Gen. W. O. Butler, commanding general of the 11th Air Force, has paid them high tribute. Early in the Aleutian campaign, there were no hangars to protect ground crews from the elements. There are not many today. Most of the repairs are made in the open. When a "push" is on, the line crews work hour after hour without letup. One day thirteen fighter missions went out, in addition to reconnaissance and patrol planes.

During the past winter a storm came up, with snow-laden gusts running up to 100 miles an hour. Six hours later, Colonel DeFord of the Bomber Command went down to the dispersal area to see what planes had been damaged in the storm. To his pleasure, he found not only that no ships were damaged by the storm due to careful preparation and anchoring, but the line crews also had two full squadrons of planes *ready* to blast the Japs.

The line crews know that their fighters are doing a large part of the job of killing Jap soldiers, destroying their weapons, destroying their ability and will to make war. Fighter pilots in the Aleutians have proved that they could pour on the Japs more than the Japs could take, week after week, month after month—paving the way for the enemy's annihilation. ☆



# THIS IS YOUR ENEMY

... IT'S YOUR LIFE OR HIS!

**AIR-TO-AIR** bombing has been employed for more than a year against our bombardment aircraft, chiefly in an effort to split up tight formations.

The enemy has directed bombs at our planes over the South Pacific, the Aleutians, western Europe, the Mediterranean and southern Europe.

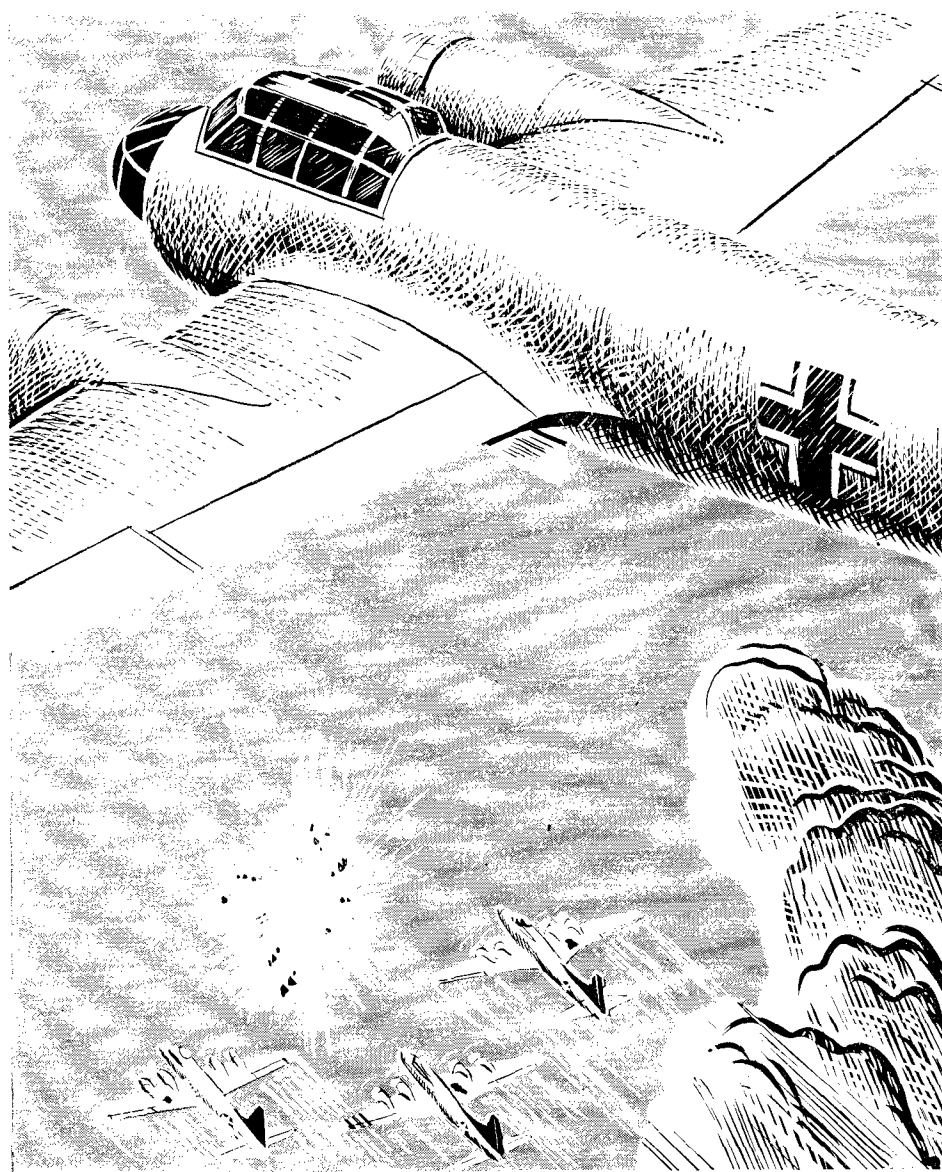
Most of the bombing has been done by enemy fighters flying from 1,000 to 3,000 feet above and in line with our formations. Although individual attacks have been most common, simultaneous aerial bombing by Jap fighters flying in V formation has been reported. Dive bombing has been attempted by both Japs and Germans, with bombs being released from 150 to 500 feet above our formations.

Enemy fighters have been known to fly at the same altitude and speed, and on the same course of a formation but out of gun range, obviously giving data to fighters overhead prior to the release of bombs from the latter. Air-to-air bombing often is followed by conventional attacks with guns and cannon.

The bombs believed used in this manner have varied from 20-pound fragmentation to 500-pounders. Our crews have reported the bomb bursts to be of various colors—red, black, blue and white; others have been characterized by purplish smoke and white streamers; still other bursts have cascaded into smoke streamers with a waterfall effect.

There is evidence that the enemy also is experimenting with balloon and parachute bombs. Crews over Europe have seen red balloons rising toward a formation and exploding with a red flash at about the same altitude. A white balloon with an attached cable was released by an ME-110 close to a formation of B-17s over the Mediterranean. Parachute bombs were reported in use over Sicily this spring. Over France a small red parachute has been observed dropping from above supporting a small unidentifiable object. In at least one instance, the enemy has dropped aerial mines, in addition to bombs, in front of the lead group of bombers.

Up to date, air-to-air bombing has obviously been largely of an experimental nature, with little or no pattern to it. But it is definitely listed as an enemy tactic, and some pilots have expressed the belief that, if perfected, it could become a threat to tight formations. The attacks have been numerous enough to score, by the law of averages, a certain number of hits; but



regardless of the number of hits, the enemy apparently hopes air-to-air bombing will affect our crewmen and impair the effectiveness of our missions. So far he has been unsuccessful.

**DECOY METHODS.** In an unsuccessful attempt to lure our troops into ambush in New Guinea, the Japs set up captured weapons abreast of our positions, fired other captured weapons to dupe our men into believing we held those places, and even posed the body of a dead United Nations soldier in view of our troops hoping they would send a rescue detail into the trap.

**LOADED PURSE.** During a German bombing raid on one of our bases in North Africa, a shower of spikes, watches, wallets and facsimiles of K rations came down along with the enemy bombs. An Arab, who happened to be standing near an American soldier, picked up one of the wallets. It exploded, killing them both.

**NIGHT FLARES.** When Nazi bombers discover our night fighters trailing them they sometimes drop a sodium delayed-fuze bomb which greatly impairs the night vision of the fighter pilot. To counteract this, the pilots duck into the cockpit and close their eyes until the glare is passed.

**THE JUMPING ITALIANS.** An operation involving about 150 Italian paratroopers, dropped at a coastal point during the North African campaign, is submitted as a perfect case of SNAFU.

The chutists were dropped so far from their rendezvous they found themselves among Arabs; ration containers were dropped before the jump but the troops were unable to find them; radio sets were ripped from their chutes and smashed; many of the water containers dropped were found to be empty.

Their mission was to destroy aircraft on Allied fields, with our bombers having top priority. But the operation resulted in only minor damage to one of our airfields.

Just to top it off, the entire group was easily captured. Only two chutists showed any sign of aggressive activity, and there was ample evidence of deliberate betrayal in order to surrender.

**RAG MINE.** Examples have been reported of the enemy slipping a rag containing a small package of gunpowder between the gas line and exhaust pipe of unguarded motor vehicles. During the African campaign, one jeep driver, noticing a bright light coming from under the hood, found a rag and threw it out. It exploded on the road.

**HOT WATER.** The canteen of a prisoner may look harmless enough, but you can't always be sure of what's inside. For example, surrendering German soldiers have been known to conceal small automatics in these water carriers. This is accomplished by splitting the aluminum container down its entire length, inserting the weapon, fitting the halves together again and replacing the canvas cover. Since the weight of the automatic is about the same as the customary water supply, the ruse is difficult to detect without close inspection.

**CUSHIONED LANDING.** Nazi mountain troops are reported to have been dropped successfully from aircraft without chutes. The jumps were made over Norway into snowbanks from an altitude of approximately thirty feet.

**GUIDING LIGHT.** While approaching his target—Kahili airdrome on Bougainville—on a B-17 night bombing mission, one of our pilots noticed a Jap reconnaissance plane flying a parallel course at the same altitude but out of range. As they neared the target area the Jap turned on a bright searchlight. Shortly afterward anti-aircraft opened up with extremely accurate flak, thanks to the setting of the B-17's altitude and speed by the Jap reconnaissance plane. However, the run was made and the targets hit with two 2,000-pounders.

**CONSTRUCTION CAMOUFLAGE.** At Munda the Japs began building runways without clearing the trees from the area, laying the surfacing around the trees in an attempt to avoid detection during the early stages of construction. We discovered the ruse and bombed the budding runway.

**NIGHT AIRDROME DEFENSE.** Night intruder raiders from the British Isles, swooping low in strafing attacks on German airdromes, have been momentarily confused by lights which look as if planes were snaking their way along the runway. The lights are mounted on a boom which is carried by an anti-aircraft truck. On other occasions, raiders have encountered the fire of anti-aircraft guns concealed in dummy planes which "taxi" out when the attackers approach.

**ITALIAN LATRINE-O-GRAM.** If you don't think enemy troops are fed the old hokum—and thick—you might dip into the diary of a certain Italian soldier.

This guy was a B-17 fan. He called it "the famous Flying Fortress which was to astonish the world." But even he was leery of the stuff they had told him about B-17 pilots.

"They say that sixty percent of the pilots are women," he wrote in his diary, "but I really do not believe it although one of the women pilots is said to have been made a prisoner from a plane shot down by pursuit planes."

Then the final touch. "They say she had a lacerated breast," wrote the Italian.



AIR FORCE, OCTOBER, 1943

## TICKET TO ARMISTICE

USE THIS TICKET, SAVE YOUR LIFE  
YOU WILL BE KINDLY TREATED

Follow These Instructions:

1. Come towards our lines waving a white flag.
2. Strap your gun over your left shoulder muzzle down and pointed behind you.
3. Show this ticket to the sentry.
4. Any number of you may surrender with this one ticket.

JAPANESE ARMY HEADQUARTERS

投降票

此ノ票ヲ持ツモノハ投降者ナリ  
投降者ヲ殺害スルヲ嚴禁ス

大日本軍司令官

Sing your way to Peace pray for Peace

Post cards bearing this little invitation to surrender were scattered about Guadalcanal by the Japs during the early days of our invasion there. On the opposite side of the card, in an attempt to make the invitation more enticing, was printed the picture of a comely nude (so comely and so nude that postal authorities won't permit our printing it), and strictly accidental.

The Japanese writing on the card instructs Jap sentries as follows: "Ticket to armistice. The bearer of this ticket is a surrenderer. It is strictly prohibited to kill this surrenderer." It is signed by the "Japanese Imperial Army Commander."

All this came from the same guys who gave such "kindly treatment" to our airmen who were captured after the raid on Japan.

P.S. The boys answered the invitations—with bullets.

**OVER-THE-SHOULDER ORDERS.** A Nazi colonel ordered his driver to blow up his staff car. He then stepped aboard a JU-52 and left Cape Bon Peninsula for the safety of the homeland. The Nazi driver watched his colonel take off in the half-loaded transport, filled the staff car with fellow soldiers and rushed off to the nearest Allied POW camp.

**NO DRIVER'S LICENSE.** Our bomber crews continue to report enemy-operated B-17s over both France and Germany, and in one case they have spotted the Germans flying a captured P-47.

The B-17s obviously are being used to observe our formations and probably to act as decoys. They undoubtedly also serve as practise targets for German fighter pilots.

The P-47, accompanied by an ME-109 and an unidentified aircraft, made several approaches at one of our bomber formations over France without attacking. ☆

# BAIL-OUT AT

First person account of a record high altitude parachute jump, made to test the AAF's bail-out oxygen system.



Before take-off, Colonel Lovelace poses (below) in the position he later assumed to step off the bomb bay platform at 40,200 feet.

*By Lieut. Col. W. R. Lovelace*

CHIEF, AERO-MEDICAL LABORATORY, WRIGHT FIELD

**H**ITTING the silk at 40,000 feet may become common before the end of the war. We have the planes to fly up there and we know that our bail-out oxygen equipment will function in the thin, frigid air. We know this because it was tried on June 24 when I bailed out of a B-17 to make certain the oxygen system would work under actual conditions.

Although high altitude flying was not new to me, jumping definitely was brand new. I never had made a jump before. In addition to setting a record, it was an experience that may make such jumps safer in the future. Aside from my personal reactions, the eight-mile descent revealed many factors essential to preserving life and health when abandoning a plane in the stratosphere.

To profit from the experience gained on this jump, you really should make the jump yourself—minute by minute, second by second.

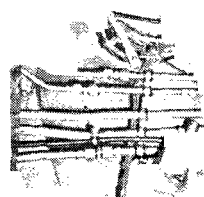
To do this, I'll ask you to step into my shoes, the GIs that go over two pairs of woolen socks.

Next, you put on your oxygen mask (a

new A-14 type) and hook it up to a constant flow commercial size oxygen cylinder that is on a two-wheel cart. The oxygen hose to the cylinder is about fifty feet long. It isn't time to fly yet. Instead, you are going to breathe 100 percent oxygen for a half hour while playing baseball with the other three members of the flight team—Boeing flight test engineers.

The time is 1000 o'clock. The ground temperature is close to 80° F. You take calisthenics, then toss the ball around for a while. It's good exercise and it doesn't take long to work up a healthy sweat. At the end of the half hour, you call time and amble over to the B-17 that is on the flying line already gassed up. The cart with the oxygen cylinders is wheeled along with you so you won't have to take that oxygen mask off.

The half hour you just spent was an all-important prerequisite to the experimental flight. During the exercise period you squeezed all of the nitrogen out of your blood, muscles and joints—a process that is technically known as denitrogenation. Aero-embolism is the price you may



pay if you don't take this precaution. Aero-embolism is a first cousin of the "bends," except that on return to sea level pressure from altitude you lose all the symptoms of the attack that was caused by bubbles of nitrogen.

Upon reaching the plane you put on your high altitude flying gear. Over your chino uniform you don the latest two-piece chicken feather suit developed for high flyers. Next, your fatigue overalls, the ones that have the bail-out bottle, altimeter and stop watch sewed into them.

You slip on your flying helmet, ear-phones and B-7 goggles— for you are wearing the new A-14 oxygen mask and your face is completely covered. Next comes the all-important parachute backpack and an emergency pack on your chest. You put a pair of silk gloves on each hand and a pair of woolen gloves over them. You crawl into the plane, detach your oxygen tube from the cylinders on the cart and hook into the bottle that carries your supply in the plane. Then, you slip on a pair of leather and rayon mittens that almost come up to your elbow.

**YOU'RE** all set, and you're on your way at 1123 as the big plane rolls down the runway. Pilot, co-pilot and flight engineer are your crew members. As soon as you're off the ground you start noting instrument readings since this is a flight to obtain practical test on equipment with complete data on all that happens.

First on the check list is the oxygen regulator, not only yours but those of the rest of the crew. You check them and the oxygen pressure of each cylinder. Months have been devoted to preparation for this flight and you can't let any symptoms of trouble pass unnoticed.

The altimeter never falters but keeps going round and round at about the speed of the second hand on your watch. You have forgotten that you are going to make your first parachute jump—a jump during which you may lose consciousness if you lose your oxygen supply for more than fifteen seconds.

It has been ten minutes since take-off, you note by the sewed-in stop watch on your sleeve. Time to check the pulse beat, color of lips and fingernails of your crew. If they should turn blue, you know the oxygen system isn't functioning properly. You make the check and find everyone is normal. So far, so good. You stroll back to the bomb bay, keeping the ten-foot special oxygen hose on your left side so it won't foul on any part of the plane. It's a short walk—no trouble to do it later on when you will step onto that small platform after the bomb bay doors are opened. You return to your post behind the co-pilot. Standing back of him you again glance at the regulators that are feeding in the oxygen—pure oxygen. Time for another pulse check. Everyone still is doing fine.

The earth has dropped away far below

## COMPUTING ALTITUDE

The parachute jump of Lieut. Col. W. R. Lovelace was made from 40,200 feet density altitude and 39,750 feet pressure altitude.

Density altitude is approximately "tapeline" altitude. Aero-dynamically, airplane performance speed, propeller pull, lift of wing, trajectory of bomb is judged by this figure.

Pressure altitude, which may be either greater or less than density altitude, is determined by the actual reading on the altimeter. Physiologically, human performance is judged by this reading. Horsepower delivered by the engines of an airplane also is a function of the actual pressure of the outside air.

Use of oxygen equipment and the probability of an airman getting the "bends" and anoxia depends on the actual reading of the altimeter in the airplane and not on the true height above sea level. An error in judging the numerical altitude by 2,000 or 3,000 feet in the 35,000-45,000-foot range may induce anoxia before a pilot is aware of his predicament.

and you still climb steadily upward. You are too busy to evaluate your flight, though, for you are checking the oxygen regulators, the pressure dials, the pulses of your crew until finally you are over 40,000 feet. You had almost forgotten that this flight is the one from which you are going to jump. You look at your check list which was carefully prepared so no slips could be made in the rush. You are being hurried now because one engine is not running smoothly.

Number one on the check list, take off the head-set. Number two, walk back to the bomb bay and step on the platform, keeping your oxygen line on the left side. Number three, have flight engineer fasten parachute to static line so chute will be opened immediately. Number four, have flight engineer open bomb bay doors.

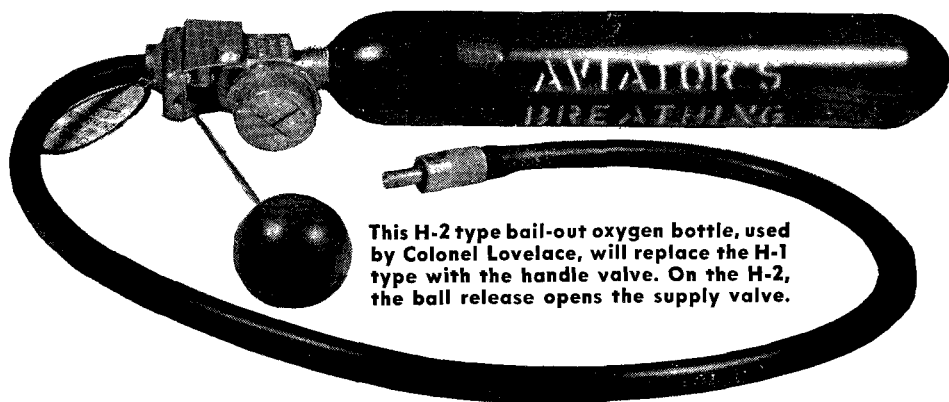
Number five, turn on bail-out oxygen supply and check to see if it is operating satisfactorily. Number six, detach hose from the plane's oxygen supply. Number seven, before you can think about it, you step off into space . . . tape line altitude 40,200 feet, pressure altitude 39,750 feet, time 1233, temperature —49° F., speed 100 mph indicated, 200 mph corrected.

You see a huge shape passing over you; it is the belly of the B-17. The tail is overhead and the engine drone is receding. You feel a terrific jerk as the parachute billows open—a jerk that throws your gloves off, you remember. Then you don't remember, for you have been knocked unconscious by the jolt.

A sensation of lazily floating on a dream cloud comes over you while something is droning in the far away and everything else is quiet, very quiet. You vaguely recall an altimeter reading of 30,000 feet. Then, it is quiet, very quiet, with that far-away hum and you look down to see the earth gradually coming to meet you. You are breathing the oxygen from that little cylinder sewed into your suit until the pressure finally drops down to zero. The altitude is 15,000 feet so you don't need additional oxygen anyway. The bail-out cylinder had plenty. Your senses begin to sharpen now. It still is very quiet except for the droning of airplane engines. You hadn't noticed the cold but you feel the warm air now.

**THEN**, you see a plane—the AT-6 that was to pick you up. You're at 8,000 feet now and you wave to the men in the plane to let them know that you are OK. Down below is a huge expanse of an already harvested wheat field. You see the big B-17 you left eight miles up has come down with you. The AT-6 swoops down for a landing. As you hit the ground, you run with the wind (for you landed downwind), collapse your chute and the jump is over. But your left hand is awfully cold when you touch it. The hand must have frozen for there's no glove on it. Your right hand is still covered by the snug fitting silk glove.

Within two minutes, the AT-6 crew is with you. The pilot helps thaw out your fingers by holding (Continued on Page 48)



This H-2 type bail-out oxygen bottle, used by Colonel Lovelace, will replace the H-1 type with the handle valve. On the H-2, the ball release opens the supply valve.

# How to Keep Well in the ITALIAN THEATRE

*Brig. Gen. David N. W. Grant*

AIR SURGEON

**E**NEMY bullets, anti-aircraft shells and other man-made implements of war are not the only hazards to the health and lives of Army Air Forces personnel now fighting in the Italian theatre.

Though not as grave, perhaps, as those abounding in more remote areas, many diseases prevalent along this north-central Mediterranean coastline can seriously deter military operations unless sufficient precautions are taken to prevent their contraction.

Generally speaking, sanitation in this area is very poor. Italy has always been faced with a serious public health problem, and health conditions are even more acute in the islands of Sardinia and Sicily. The ceaseless Allied bombing of much of this area and the strain of more than three active war years have lowered considerably even those health standards which normally existed.

Water and sewage facilities are extremely inadequate except in very few of the larger communities. In some cases municipalities obtain water from lakes and reservoirs in the hills and mountains and transport it from these surface collections by means of aqueducts. In rural areas shallow wells, springs and streams are used. Many water supply systems are ancient and, for one reason or another, are frequently cross-connected with sewers.

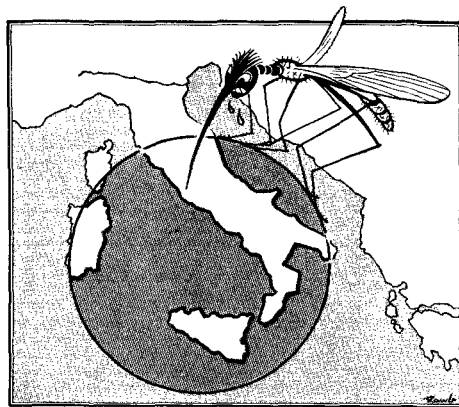
Sewage treatment systems are rare in this area. Sewage is usually emptied raw into streams or into the sea. Pit privies are generally used in rural areas and in many of the slum sections of larger cities. Human waste is frequently collected by cart and used as crop fertilizer.

The high rate of typhoid and paratyphoid fevers, particularly in the vicinity of Rome, indicates that water is frequently contaminated. For the purpose of military forces going to the Italian theatre, all water must be considered dangerous and should be treated by military personnel before use.

Pollution of the soil also renders fruits and vegetables unfit for eating unless they are dipped in boiling water. Milk, too, should be boiled for there are few facili-

ties for pasteurization in this area. Tuberculosis and undulant fever are common in dairy herds.

Of the insect-borne diseases, malaria is by far the most prevalent in the Italian theatre. The Romans centuries ago shied away from the Pontine Marshes, expansive swampland along the Tyrrhenian Sea coast west of Rome, because they believed evil spirits were in the air over this area. The "evil spirits" happened to be mosquitoes but their precautions were well founded. Although the marshes were drained—mainly to reclaim land for economic use—by the fascist regime several years ago, malaria still abounds in this section of the Italian boot. Italy's malaria



rate is among the highest of the Mediterranean countries, and that of Sardinia is considered to be the third highest of any area in the world.

Throughout the Italian theatre, troops should be particularly on guard against malaria-bearing mosquitoes. When you go out after dark, wear long trousers tucked into boots or leggings, and long-sleeved shirts. Use mosquito repellants, headnets, gloves and mosquito boots whenever possible. Sleep under mosquito nets.

Dengue or breakbone fever, also mosquito-borne, is prevalent in the coastal areas. Although this disease is rarely fatal, it is incapacitating and, should it reach epidemic proportions, it could seriously hamper the military effectiveness of

troops. The same mosquito which carries dengue also is the carrier of yellow fever. This disease, however, has not been found in Italy for many years, but the return to the country of infected individuals or the transmission of an infected mosquito by plane or ship from a yellow fever area could cause the rapid spread of the disease.

With this possibility in mind, Army Air authorities have been careful to spray with insecticide the planes taking off from points in central and west Africa for Mediterranean bases.

The presence of disease carrying ticks, lice, sandflies and the like in the Italian theatre makes it necessary for military personnel to take additional precautions against insect bites. A new GI powder repellant for use against creeping and crawling insects has proved particularly effective. Troops should bathe whenever possible, examine their bodies carefully for ticks and lice, and inspect their wearing apparel frequently.

Mediterranean tick fever, or Boutonneuse fever, is found throughout Italy and Sardinia. It is borne by dog ticks and is much like our Rocky Mountain spotted fever. Typhus and relapsing fever are two louse-borne diseases common in this area.

Here, as in other war theatres, utmost care should be exercised by military personnel to avoid venereal diseases. Syphilis, gonorrhea and chancroid are prevalent in Italy. Normally, prostitution is controlled by police laws requiring segregation and medical examination at weekly intervals, but considerable laxity in enforcement is to be expected under the stress of immediate military operations.

In summary, it should be borne in mind that simply because this theatre of operations happens to embrace a section of the world that is highly civilized, in contrast to many of the areas in which our troops are fighting, health precautions must not be tossed overboard. This theatre, if anything, has more than its share of health hazards in peacetime, and as the scene of active combat operations these hazards are multiplied manifold. ☆



# AN TO MEN OF THE ARMY AIR FORCES

It is a privilege to reach the men of the Air Forces through our official service journal as it gives me an opportunity to tell them of the wonderful work their wives and mothers are doing, and to ask them to cooperate with us more and more as time goes on.

You know, we wives and mothers of the Air Corps are red-blooded, self-respecting American women who want to do our part in the organization to which our men belong. We want to take care of the home front while our men are fighting or in training. Our first responsibility is to our homes and children; our second, to see that our Air Corps family is kept busy and happy.

We already have made an excellent start. Through training in Red Cross classes, we are taking our places in volunteer work of various kinds. In some places our Air Corps hospitals are being supplied with dressings and other articles made entirely by Air Corps women in post Red Cross auxiliaries. We have nursery schools on many posts. There are canteens in operation, manned by wives of Air Corps men. The cadet wives in some training centers are organized to take care of the housing situation.

The Air Forces Branch of Army Emergency Relief is using volunteers to help in its relief work in many locations. Mrs. Barney Giles has recently been appointed to organize Army Emergency Relief Volunteers in the Air Forces Branch, as the duties of the Army Emergency Relief officers are growing more complicated as time goes on, at all posts, and the need for volunteers is increasing. Air Corps Mothers Clubs are being organized all over the country; their aims and purposes are to make it happier for their boys and for the boys of other Air Corps mothers who are not at hand. In one city the Air Corps Mothers Club has a sewing room where any cadet can bring his clothes in need of repair, and find an interested and capable "mother" to take care of him.

In addition to such volunteer activity, there are many fields of endeavor in which the women of Air Corps families are busy doing war work—airplane factories, for instance. In fact, in industries of all kinds they are taking their places to relieve men who are needed in the Army.


Yet, there is much more to be done. I am asking you to help in seeing the problems and to cooperate with us in carrying out plans for the future. If near a post, there is work to be done in the chapels, libraries, hospitals and Army Emergency Relief. On some posts, the Red Cross auxiliaries are already organized and doing fine jobs. We need more auxiliaries. We need volunteers on relief committees in the Army Emergency Relief. We need sympathetic Air Corps women to help morale among the enlisted men's families when tragedy strikes; it may be just a note of sympathy—a word to say, "Call on me if you need help."

We are all one family. We need the backing-up of our husbands to do some of these things, especially if new in the Air Corps. After a visit to many of our camps that have sprung up over night, I found the most urgent need to be a Bureau of Information for the women who come to see their men at camp—often to say "goodbye."

Someone wrote me the other day and said, "Can't something be done to keep these wives at home? There is no place for them around here—even for a day or so."

I say the Air Corps women are loyal and devoted to their husbands and that nothing in the world can keep them from going to say "goodbye." Therefore, it seems a simple thing for us who have spent many years in the service to at least have a desk where questions can be answered on transportation and housing and on many other important subjects. This can be, and often is, done by auxiliaries on our posts. Where there are no auxiliaries, let it be a function of the Army Emergency Relief Office and man it with volunteers of the Air Corps. There is no necessity for civilian organizations to take over duties which are rightfully ours.

Please—put the feminine members of our big family to work! They want to help and you may rest assured that while you are in far places we will do our utmost to take care of those left at home, for, as in the words of Martha Merrell's lovely poem, "Nothing can ever break the tie that binds the wives of the men who fly."




Phyllis P. Arnold

MRS. H. H. ARNOLD


# BETWEEN MISSIONS

## With the AAF around the World

WHILE every theatre of operations has its own peculiarities, bunk fatigue and relaxation between missions is pretty much the same the world over. The boys read; they write home; some go sightseeing when there are sights to see; they play cards; they build and patronize their own clubrooms; they play ball and a thousand other games they've made up for their own diversion; they play in the surf when there's a beach nearby. In a few choice spots there's even feminine companionship to be had. But here are a few of the stag activities engaging AAF personnel around the globe.



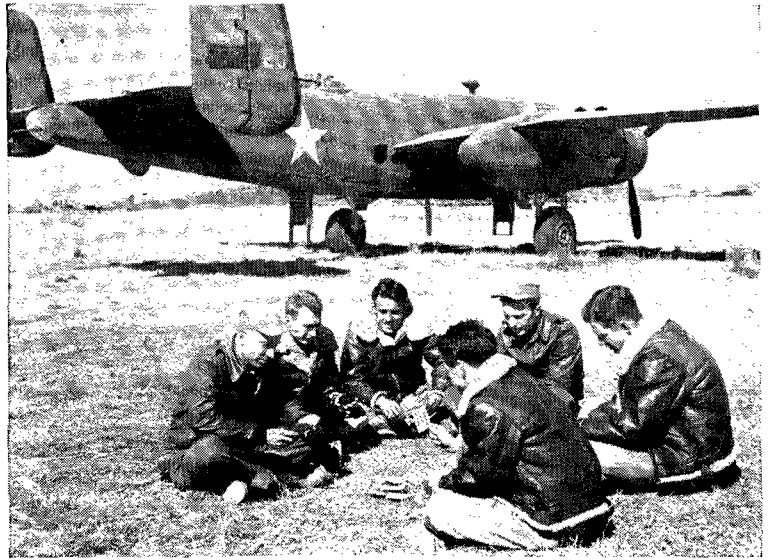
**BEACH PARTY.** Sunny Florida? No indeed! These men of a heavy bomber squadron enjoy the beach and surf on a South Pacific island.



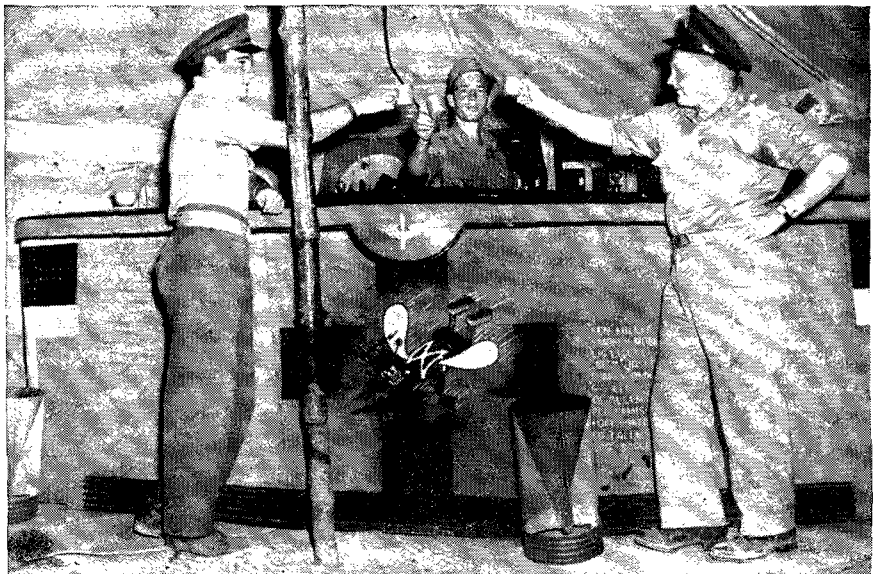
**LONDON TOUR.** St. Paul's Cathedral in London, surrounded by scars left by German bombers, is a sight these two Yanks will long remember.



**BATHROOM BALLAD.** While not as modern and shiny as that tiled shower at home, this halved gasoline barrel suffices in Alaska. And the vocals are the same.

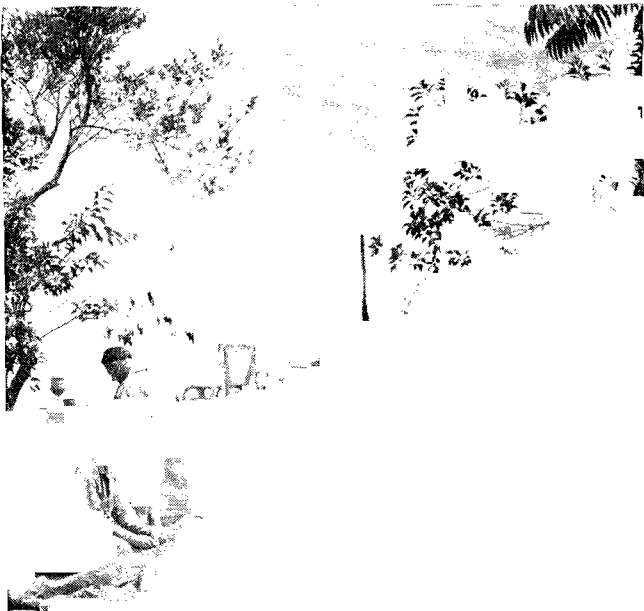


**THE PASTEBOARDS.** A little game of fan-tan occupies the time of these members of a B-25 crew in China as they await word to take off on a mission over Jap-held territory.



**UNIQUE SCRAP HEAP.** This bar in North Africa is made of salvaged parts from enemy planes: front panels are ME-109 wings, rail from a JU-88 and the top from a French plane used by the Nazis. The bomb fins hold cigarette butts quite adequately.

**RELAXING 'ON THE SET.'** These fighter pilots lounge on bunks during a "stand-by alert" at their Caribbean airbase.



**WARM-UP.** The great American pastime is a lot of fun even in the Aleutians. Does it matter if a righthander uses a lefthander's mitt?





# OUR NEW AVIATION CADET PROGRAM

*By Lieut. Col. Willis S. Fitch*

CHIEF, AVIATION CADET BRANCH,  
HEADQUARTERS, ARMY AIR FORCES.



A cadet at Brooks Field, Texas, looks into the future.

SOME time ago our office received the following telegram:

WAS NOTIFIED WOULD BE CALLED TO ACTIVE SERVICE ON ..... HAVE USED ALL GAS, COFFEE, SUGAR STAMPS. SOLD AUTO, FURNITURE, CLOTHES. QUIT JOB, WIFE. MADE WILL AND PEACE WITH MAKER. AM TEMPORARILY LIVING IN MAN-HOLE. IF THROUGH ERROR WAS ENLISTED FOR NEXT WAR, CHANGE TO THIS ONE.

We've received others like it from eager and impatient enlisted reservists.

It is no secret that during the early stages of the war it was out of the question to build and expand training facilities rapidly enough to accommodate the vast numbers of men who flooded the Army with their applications. Some of those accepted had to wait weeks or even months before beginning pre-flight work.

Thousands of enlisted men as well as civilians were rejected for one reason or another upon application for flight training. Our educational and physical standards were rigorous. This tradition of the AAF undeniably caused many disappointments.

Today, both sides of the picture are greatly changed. The purpose of this article is to set forth the "how" and "why" of such changes.

Creation of ample training facilities was in itself a huge undertaking—construction of scores of airfields, production of aircraft, building of various classroom training devices and the like. All this has been accomplished. In addition, more than 100 of the country's top-ranking colleges and universities have been brought into the academic phase of our flight training program. A man who is now accepted for aviation cadet training in the AAF begins intensive work within the month of his acceptance.

Throughout, it has been the Army's policy to maintain the quality of training at the highest possible level. Anything less would have been unfair to the cadet himself, would have been a military inefficiency. Delay in training was far preferable to the alternative, a lowering of training standards.

Proof that quality of training has been sustained is the fact that, even in a stepped-up tempo of wartime, more than 95 out of 100 pilots are being trained without injury of any kind. This achievement has received recognition from the National Safety Council which on June 22, 1943, presented to the Commanding General of the Army Air Forces a special wartime award for "Distinguished Service to Safety."

Educational and physical requirements for flight training were adhered to for the same reason. Here, however, there was another consideration.

An Air Force is primarily a striking power. As such it depends upon an extreme degree of teamwork all along the line, particularly among members of a bombardment crew. It was and is essential that such crews be composed of men eminently adapted for the work.

Had standards of any kind been lowered at the outset of the war—without benefit of battle experience—the entire success of the AAF might have been materially affected.

But with nearly two years of war behind us we have discovered many things. It has been found, for example, that some graduate Ph.D.'s fail to display any aptitude for military flying, whereas some men with only one or two years of high school education become expert.

Likewise it has been discovered that certain physical requirements did not warrant the importance given them. Dental qualification was a case in point. Our requirements in this regard today might well be summed up by the statement, "If you can eat, you can fly."

In other words, after extensive study and analysis, after careful examination of the experience not only of our own Air Forces but those of England and Canada, we concluded that certain requirements for flight training could safely be made less exact—safely from the standpoint of the student, safely from the standpoint of military efficiency.

That is the "why" of recent changes introduced in our Aviation Cadet program.

What are the present requirements?

First, physical attributes. The requirements for both visual acuity and hearing have been altered slightly. An applicant whose visual acuity measures as low as 20-30 in both eyes—correctible to 20-20 in both eyes—will now be accepted for air crew training if otherwise qualified. The minimum hearing requirement now permits 15-20 hearing in one ear, while the 20-20 standard in the other ear is still demanded.

Restrictions as to teeth, height, weight and other physical conditions have been modified. This includes the standards concerning feet. The day is long past when a flat-footed man might have trouble with the pedals of an airplane.

Lack of a formal education is today no handicap, since our tests for aviation cadet training are designed primarily to determine flying aptitude. Practical judgment and rapid perception are the basic necessities rather than education. Experience as a mechanic or as a soldier is quite as apt to be an advantage as a college degree—particularly since the passing grades of academic examinations have been lowered. This latter point should be of particular interest to many men who were borderline cases in the first bout with the cadet examinations.

Suppose you are an enlisted man, want

## War experience has wrought many changes in requirements for flight crew training.

to fly and feel you can pass these moderate requirements. How do you go about it?

Virtually all airfields and airbases have aviation cadet examining boards. If there is none at your field there is certainly one in a nearby city and your commanding officer will grant permission for you to visit it.

You can obtain an application from the CO of your field. Or, if for some reason you prefer it, you can probably obtain forms from such organizations as the Red Cross or USO or from any U. S. Army recruiting station.

You must be a citizen; must have passed your 18th birthday and not reached your 27th; you must accompany your application with a copy of your birth certificate and three letters of recommendation.

When the aviation cadet examining board receives these documents, you will be given an appointment for examination. The mental screening test takes less than three hours. The physical examination will require several hours.

If accepted for aviation cadet training you will be transferred to the Air Corps on an unassigned basis. This means that you will be definitely transferred out of the unit with which you have been stationed. Even if it subsequently should be "alerted" for overseas duty you will be given your opportunity to stay in this country for flight training.

Another point of considerable importance is the new provision by which you may retain your rating.



An aviation cadet in active training receives \$75 a month plus a monetary allowance of one dollar per day subsistence. In addition, he receives quarters, medical care, uniforms and all incidental equipment, and is given a \$10,000 government life insurance policy while undergoing actual flying training (which must, however, be continued at his own expense after graduation).

An enlisted man who holds a rating may, during the period of training, obtain the alternative status of aviation student rather than aviation cadet. This means that he will be paid on the basis of his rating and can maintain dependency allowances and other benefits.

As was stated previously, the man accepted for cadet training can expect to begin such training within a month. He will first be sent to a classification and basic training center. There further tests will be given him to determine whether he would be best suited as pilot, bombardier or navigator.

If he has had basic military training he will then be sent promptly to one of a selected list of colleges for a five-month period to receive some further military instruction, physical conditioning, and—toward the latter part of the course—some flying. He will also take up several courses of study designed to help him in his subsequent pre-flight and academic training. These courses will be assigned to him in accordance with his previous education.

If, incidentally, he has not been found well adapted to the requirements of a pilot, bombardier or navigator, he may still have the opportunity of becoming a member of a combat crew by being assigned to an AAF technical school and subsequently to flexible gunnery training.

Granting, however, that he is sent to a college, an aviation cadet or student upon completion of his five-month college course will go at once to a pre-flight school.

There, in a nine-weeks course, he will obtain instruction in engines, aircraft structures, theory of flight, meteorology, radio and communications practice, aircraft identification and other allied subjects.

He then will begin actual flight training, going through the three stages of elementary, basic and advanced training, and upon graduation receive the rank of flight officer or second lieutenant. Both ranks carry the same pay—\$246 per month for single men, \$327 per month for married men, which includes fifty percent extra base pay for flying duty, subsistence and quarters allowance if required. In addition, a uniform allowance of \$250 is given to each officer upon graduation.

Our new aviation cadet program is designed to give every man who wants to fly a chance to play his part in the future of American aviation. ☆



# PREPARE FOR



## TIMELY ADVICE FROM THE AIR INSPECTOR

*Matters presented here are informative only, and are not to be considered as directives.*

### PROPER ASSIGNMENT OF PERSONNEL:

We know a base administrative inspector who checks on ten assignments of personnel a day to see that the right man is on the right job. The inspector is building morale plus, and, in addition, is assuring that the base is getting the most out of its men.

Proper assignment is a *responsibility of command* (AR 345-5). Assignments made by a commander are a criterion of his efficiency. They are not to be made for his sole convenience, but for the benefit of our war machine as a whole.

To the individual, malassignment often becomes a morale deterring factor which causes the soldier—officer or enlisted man—to become a liability instead of an asset.

Much has been done to assure proper assignment in the Army Air Forces following a conference in Washington of personnel officers of the Air Forces and commands, but correction is a constant process. Check and check again on malassignment.

**BIG AND LITTLE:** Squadron Supply Officers: Those big and little men in your organization may get cold feet—and not from meeting the enemy—if you land them in the Aleutians without extra shoes to fit them. POM inspectors checking at final phase training stations to see that you do not make this mistake report that they must remind many of you to submit requisitions for six months' maintenance of special measurement or nontariff size clothing.

**CHECK BEFORE FORCED LANDING:** If the airplane in which you fly is equipped with an emergency sea-rescue transmitter, are you as familiar with it as you should be? Do you know where it is stowed in the ship? Do you know how to unpack it, assemble it and get it operating? This is an efficient and useful piece of apparatus in case of forced landings, especially at sea, but it isn't much help if it is allowed to sink with the plane. An in-

struction book is packed with the set, but it is a good idea to know something about the equipment before you find it necessary to open the package.

**KNOW YOUR ALLIES:** To salute or not to salute—that is often the question overseas when a man in an Allied uniform comes into camp. To keep you posted, WD Training Circ. 70, May 21, 1943, directs that all military personnel will be instructed so that they will be able to recognize the commissioned personnel of the principal Allied nations. This instruction will be given in training and staging areas and aboard transports.



Keep that mechanic on the line . . .  
and we don't mean typing line.

**CRASH TRUCK CHECK-UP:** Notes from the scratch pad of a technical field inspector after checking on crash trucks:

"Crash kit incomplete and improperly maintained. Some tools rusty. Low speed hack saw blades in kit. (TO 00-30-44) . . . Short on Asbestos suits. Suits improperly stored (TO 13-1-7) . . . CTC fire extinguisher low in pressure. . . . CO<sub>2</sub> fire extinguisher equipment not stenciled as required by TO 16-20-2 . . . Flashlights not kept in a suitable metal container, and no record of flashlight inspection available. One light inoperative. No spare flashlight batteries on hand (TO 00-30-44)."

What is the condition of your crash trucks?

**AIRCRAFT MAINTENANCE FORMS:** Crew chiefs and engineering personnel, you are reminded by technical field inspectors of the importance of keeping up aircraft maintenance forms. It is only through the use of these forms that historical records of the planes can be preserved and necessary maintenance performed. Frequent inspections of such forms as Nos. 1, 1-A, 41-A and 41-B are necessary to assure that they are kept properly at all times.

**THE INSPECTOR IS IMPRESSED:** Use of the telephone to save rubber and gas was graphically demonstrated for a major from The Air Inspector's office when he called for a car to take him from a western railroad depot to an airbase ten miles away. The girl driver who appeared at the station apologized for being a few minutes late, explaining that the motor pool dispatcher had telephoned the main gate at the base as she was leaving and instructed her to pick up an express package on the trip to town. The major assured her that there was nothing like "killing two birds with one stone."

While driving through town enroute to the base, the driver stopped the car and said: "I have to stop at that drugstore over there and telephone the base to see if there are any other assignments in town. The free use of the phone is one of the store's contributions to the cause."

The inspector was duly impressed.

**PARACHUTE TOWER HAZARD:** A technical field inspector noticed a snagged parachute in his inspection of a parachute room at a west coast base. Seeking the cause, he found exposed nails in the tower. If you are a parachute rigger, you should "spike" this possibility of torn parachutes by looking over the walls of your tower today.

**KEEPING THE GASOLINE FLOWING:** "You have to keep 'em rolling to keep 'em flying."

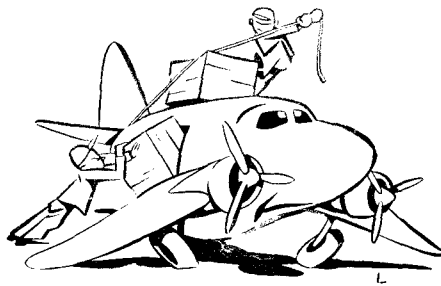
These words were never more true of the big AAF fuel servicing trucks than they are today. They are being called on to make long hauls of gasoline, which often test the metal of the trucks to the limit. More severe usage calls for better

maintenance. Technical field inspectors are stressing this fact wherever they go, and your compliance may mean the difference between planes in the air and planes on the ground.

**HOSPITAL FIGHTING MEN:** Just because a germ has your serial number on it, soldier, and you land in a hospital you have not been scratched off the list of potential fighting men. Your training is carried on.

AAF Memo. 25-9 provides for a convalescent training program in all AAF hospitals. This program is designed to prepare patients for full military duty by carefully supervised physical training and by a course of military instruction.

Inspectors can be of considerable help in assuring the utilization of convalescence time for training. They should check especially to see that training aids such as films and film strips are available, and that there is coordination with such men as the special service officer, Red Cross representative and chaplain.



**BREAKING THE PLANE'S BACK:** A cross-country truck driver knows the weight of his load just as readily as he knows his own age. And, if it is important for him to know that, it is twice as important for a pilot to know the weight of his plane load.

With the increase of gross permissible weights, the importance of never loading airplanes beyond these limits is greatly increased. Technical inspectors in the field report, however, that some pilots are not paying sufficient attention to the gross weight of their aircraft and are unable to

estimate it within 1,000 to 2,000 pounds.

The center of gravity location is equally important. It can be found by the load adjuster, supplied with most modern aircraft.

**GOOD FROM BAD WEATHER:** "Ceiling zero."

That is the signal in a tactical organization for a take-off on administrative work. Squadron commanders, you may be able to improve your administration greatly by checking to see whether those non-flying days are being fully utilized.

**TACTICAL INSPECTION:** To make your organization second to none in combat, your tactical inspector is stressing:

Constancy of supervision.

Teamwork.

Realism in Training.

Planning of training flights, wherever possible, over terrain similar to that in which the unit will operate overseas.

Familiarity of pilots with the types of hostile aircraft likely to be encountered, their armament, armor and fields of fire.

*(Inspection Continued)*

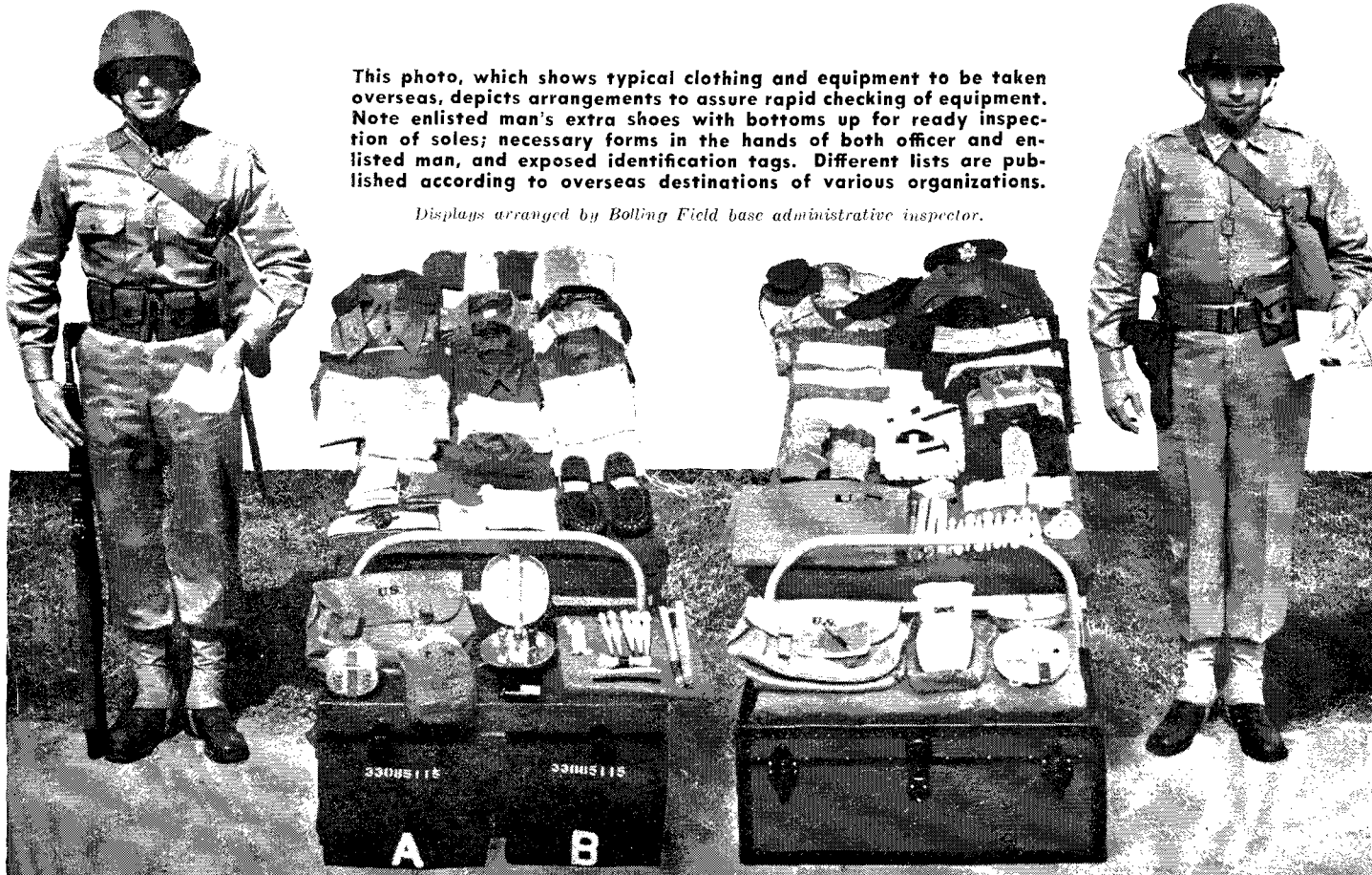
**Showdown Inspection:** Attention: commanding officers of Overseas Replacement Training Centers.—It is your responsibility to see that officers and enlisted men going overseas are as fully equipped as possible with serviceable material. Don't wait until the last minute. Every man must be inspected to see that his clothing is properly marked and will stand six months of wear; that his shoes are serviceable; that his qualification firing as been entered on his Form 20. Although they may

seem trifling, such details are of major importance and must be accomplished. Every soldier is anxious to know what to do. Help him now with a display.

To accelerate overseas preparations, POM directs that a showdown inspection be held immediately after warning orders are received. The Air Inspector feels that a permanent display of clothing, equipment and records in proper order, under the supervision of a competent guide and instructor, would allow each man in ORTC to become familiar with what is standard.

This photo, which shows typical clothing and equipment to be taken overseas, depicts arrangements to assure rapid checking of equipment. Note enlisted man's extra shoes with bottoms up for ready inspection of soles; necessary forms in the hands of both officer and enlisted man, and exposed identification tags. Different lists are published according to overseas destinations of various organizations.

*Displays arranged by Bolling Field base administrative inspector.*





## HERE ARE THE ANSWERS

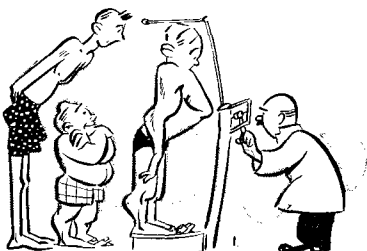
**Q. Is there a limitation on the amount of dividends an Army exchange may declare?**

**A.** The amount of dividends distributed to organizations will not exceed an amount equivalent to fifty cents per man per month (WD Circ. 98, 1943).

☆☆☆

**Q. What are the size and weight requirements of fighter pilots?**

**A.** Six feet or less in height, 180 pounds or less in weight (AAF Reg. 35-26).



**Q. Is the recording of the chest X-ray in the Service Record still required?**

**A.** No (WD Circ. 137, 1943).

☆☆☆

**Q. What is the priority for Quartermaster Corps laundry service?**

**A.** 1. Enlisted men's laundry. 2. Hospital, government property, Army Transport Service. 3. Officers and other authorized patrons (Par. 14a, AR 210-10).

☆☆☆

**Q. May an officer maintain personal files of War Department publications?**

**A.** No, unless he is assigned to duty of such character that official files are not readily available for reference (Par. 1c, AR 310-200).

☆☆☆

**Q. May a flight officer perform any air crew duty?**

**A.** No qualified flight officer will be denied, because of his grade, the opportunity of performing any air crew duty

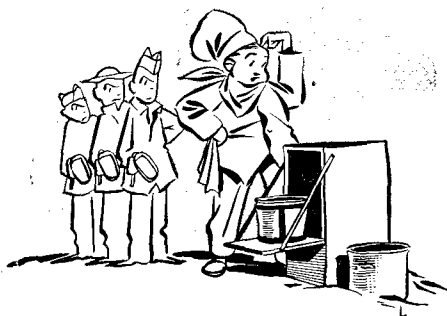
normally performed by a commissioned officer (AAF Memo. 35-21).



**Q. Is there a directive forbidding the exchange of shoes that do not fit among enlisted men?**

**A.** Yes. WD, AGO Memo. S850-31-43 states that if shoes do not fit after they have been properly broken in, enlisted men will be refitted under the supervision of their organization commanders. Under no circumstances will shoes be exchanged with other enlisted men.

**LIGHT UP FIELD RANGES:** You are supposed to keep your field ranges (M-1937) gleaming, but the gleam should not be the original one put there by the manufacturer. Take a tip from mess sergeants overseas and start training with the ranges



be reactivated by baking at about 400 degrees Fahrenheit until the blue color is restored. One common way is to place a medium power electric light bulb in a coffee can, fill the can with crystals, and turn on the light. Do not employ the simple but ruinous expedient of drilling a hole in the bottom of the housing to permit water to drain off.

**FIRE PREVENTION IN HANGARS:** Do you work in a hangar? If you do, AAF Reg. 85-6 should be on your must reading list. You will not find this regulation on fire prevention "dull copy." It tells you how to avoid disaster for yourself as well as for the expensive and vital equipment in the hangar. Some points well worth

checking for compliance in your own hangar are:

When planes are brought into the hangar for storage or repairs, either overnight or for a longer period of time, or for repairs after having been serviced with gasoline, great care will be taken to prevent overflow of gasoline tanks from expansion due to change of temperature. Airplanes will not be refueled or drained of gasoline while inside buildings.

Blow torches will be restricted to isolated places in the hangar.

Radio transmitters installed in aircraft will not be tested or operated with the dynamotor running, unless all parts of the antenna system are at least one foot away from any other object. ☆

the day they are first unloaded in your organization supply room. You will know what to do then on a rainy night in Australia when the burners refuse to function and several hundred hungry men are rattling their mess kits. Particular note should also be paid to WD Circ. 143, 1943, which rescinds WD Circ. 359, 1942, and places the responsibility for preventative maintenance, including cleaning, minor repairs and replacement of worn or damaged parts, on the using organization.

**BLUE OR PINK CRYSTALS?** Radio operators, do you check regularly the colors of your "chameleon"? The chameleon, of course, is the dehydrator which permits the housing for the automatic radio compass to "breathe." The crystals (silica gel) in the transparent tube of the dehydrator should be a deep blue, but they fade to a pale pink when they become saturated with water absorbed in the very necessary process of drying the air passing into the housing. Saturated crystals can



## INSPECTING THE INSPECTOR

**Do your inspections stop short of determining the cause?**

☆☆☆

**When someone comes to you with a perplexing problem, are you supplying the answer or "passing the buck"? Do you have complete sets of regulations and directives to give answers quickly?**

☆☆☆

**Base administrative inspectors, are you concentrating your efforts on alerted units? Are you giving them every possible assistance in their show-down inspections? Are you stressing important items, not picaresque points?**

**Command inspectors, are you keeping in mind the provisions of POM and AIR POM when you make your inspections during the various periods of training? Commanders of units inspected by POM teams at final phase training stations have stated that they wished they could have been given similar inspections earlier in their**

**training. All "inspection roads" should lead to overseas movement. Your philosophy should be "advise, aid and be sure that responsible persons understand what must be done and how it must be completed prior to readiness date." Such philosophy does not go so far as to excuse gross negligence or even carelessness, but you will find those factors apparent in only a few instances.**

☆☆☆

**Are the basic fundamentals of soldiering being neglected due to extreme concentration on specialist training?**

☆☆☆

**As a base administrative inspector, are you thoroughly familiar with AR 210-10? This regulation lists the responsibilities of a base commander, and they all are matters to be looked into by an inspector.**

☆☆☆

**Are you seeing that there is emphasis on these three points—Discipline, training, leadership?**

# FASHIONS FOR FLYING NURSES

By Cpl. Douglas J. Ingells  
Wright Field



Flying nurses wear this outfit when they aren't in the extreme cold. It is blue-grey worsted two-piece suit (skirt of same material can be worn). Boots are of rubber and felt with sheep shearing. The cloth helmet is wind resistant and Alpaca lined.

In the Arctic cold the girls wear long undies made of cotton rayon. The stuff doesn't scratch, fits skin tight and holds body warmth.



FOR years men in the clothing unit of the Materiel Command have been designing high altitude flying suits and other paraphernalia for our airmen who are subjected to the cold of the stratosphere and for ground personnel who keep our planes flying in the frigid temperatures of the Arctic circle.

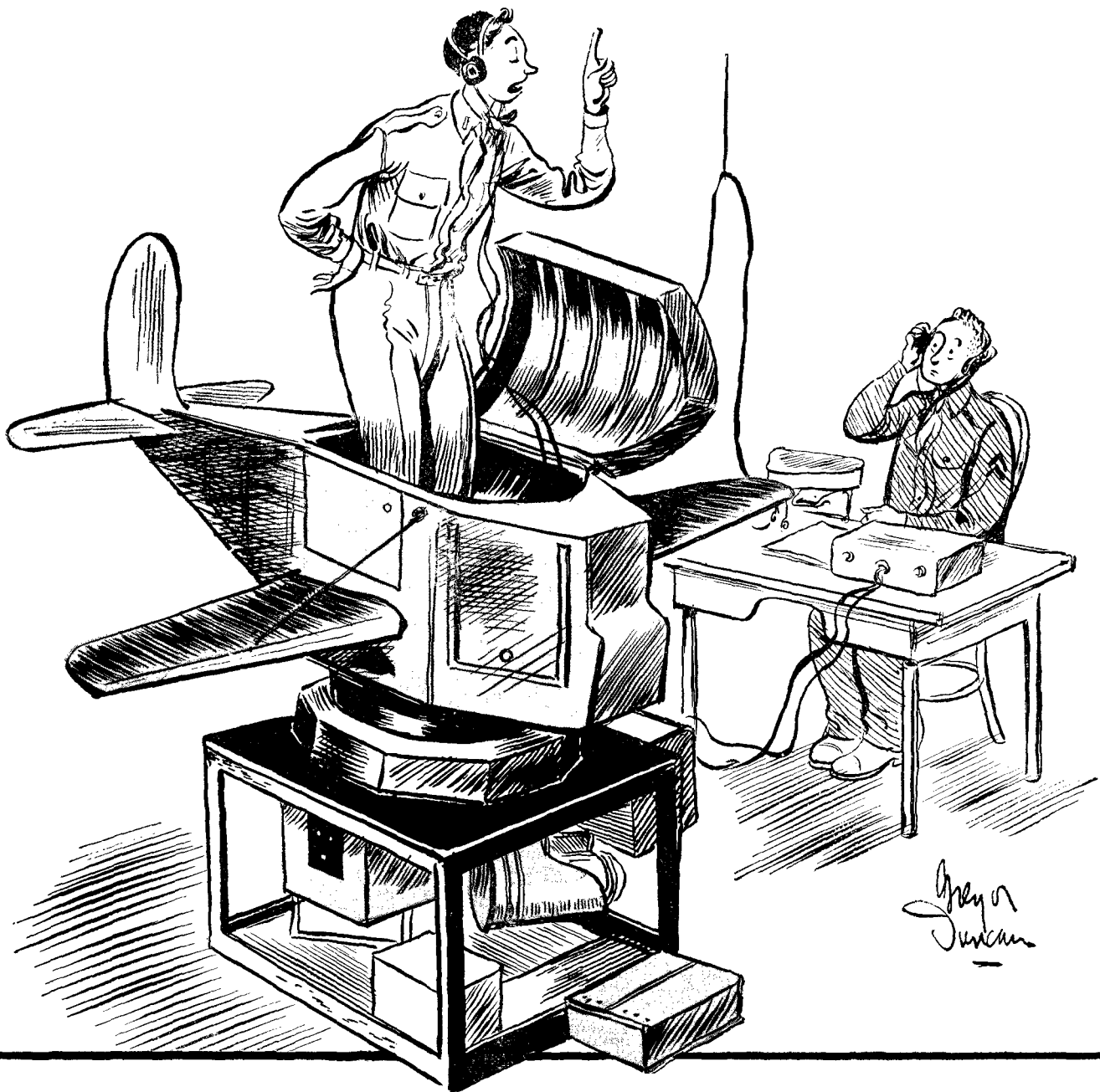
But now these clothing designers are faced with a new demand in styles for Arctic and high altitude wear—flying suits for the flying nurses of the Air Evacuation Group. These nurses are now flown to all theatres of operations where American troops are fighting the enemy, and they need new types of women's clothes—dress designs that will keep them comfortably warm under any circumstances.

"We realize that for warmth our clothing may have to be bundlesome, but please give us something with some style to it." This was the plea the nurses' commandant directed to the AAF clothing experts in the equipment laboratory at Wright Field. Our tailors went to work, embodying in the designs specifications and recommendations made by the nurses themselves, and soon they came up with a snappy batch of togs that make the flying nurse look like the little lovely who is taking in the skiing season at Sun Valley.

A few of the frigidwear styles are shown in the accompanying photographs. Almost every week now, a new shipment of these garments is flown to Alaska, Greenland, Iceland and other bases to make our nurses the warmest—and best dressed—of them all. ☆

This is the complete Arctic costume for flying nurses: Two-piece light-weight flying suit worn under Parka-type outer garment, Mukluk boots, gloves and purse. The coat is cotton poplin lined with Alpaca, the Muklucs have rubber soles and canvas tops, and the hood is trimmed with wolf fur. The entire outfit weighs little more than eight pounds.





## **'I WON'T GO A FOOT HIGHER WITHOUT OXYGEN!'**

Maybe Charlie is a trifle overcautious—but his instincts are good. He shows the beginnings of a fine altitude attitude.

But he isn't perfect—not yet. Although he knows the life-saving necessity of oxygen at high altitudes and always uses his mask at the proper times, he has a tendency to forget some important details in using his A-10 mask. Such as:

Checking his flow regulator and emer-

gency valve before take-off. (He has left his auto-mix "OFF" at low altitudes a few times, too, thereby wasting his oxygen supply.)

Checking the pressure gauge.

Obtaining a better fitting mask.

Keeping oil and grease away from his oxygen equipment and making sure it's always in *perfect working order*.

Second of a series by the Flight Control Command.



# GROUND OBSERVERS CAN TAKE IT

By Charlotte Knight

**Y**OU'VE heard 'em; so have we. Priceless stories about our ground observers—such as the yarn, now worn and tarnished, about the woman who picked up her observation post phone and reported a P-38 to her filter board as “something that looks like two planes with their arms around each other.”

Or the one about the observer who spotted a plane “with raglan sleeves, flared bodice and a nipped-in waist.” Or the blimp seen from some distance as “one submarine, flying high.”

Ever since Pearl Harbor the nation's cartoonists and gagmen have had a field day at the expense of the AAF volunteer ground observers—called “spotters” in some sections. These trusty civilians have taken it on the chin from time to time because they have failed to identify certain test planes flying over their posts. What the wisecracks and critics haven't known was that in months past it was not the responsibility of observers to *recognize* a plane overhead. Their specific orders from the fighter commands instructed them merely to report the number of aircraft, the number of motors, approximate altitude, location from the post and direction of flight: “One bi-motored—high—two miles—SE . . .” and so on.

To most of the many thousands of observers manning the vast network of observation posts flanking our coasts, such designations as P-47, A-20, B-26, L-type and the like were just so much aeronautical jargon.

Mrs. Clemens had “enough to do, heaven knows, with the children and the house, and working for the Red Cross and taking my ‘watch’ on the OP without learning the difference between a P-39 and a P-40 or whatever they call ‘em.” Besides she couldn't even tell a Studebaker from a Packard; how could she be expected to tell a Marauder from an Avenger?

So it went—for a whole year. *Every* plane in fighter command areas was reported by a telephone call; every call was plotted on Army filter and operations boards. As the AAF expanded, the number of operational flights increased every week. Aircraft warning information centers became swamped with calls until every filter board looked as if someone had dropped a can of angleworms on it.

There remained but one solution:

## **The AAF relieves a headache for its Aircraft Warning Service by teaching ‘spotters’ aircraft recognition.**

Eliminate the majority of these “plots” by teaching the ground observers to recognize our ships by type; relieve the congestion on the filter boards by instructing the observers *not* to report specified types.

Teach aircraft recognition to hundreds of thousands of civilians whose time was already taken up with jobs and volunteer war activities? Teach it to people to whom an error in type might mean failure to report an enemy bomber overhead?

“Impossible!” said our coastal fighter commands. So they did it.

**N**ow, six months later, housewives, school boys, lawyers, stenographers, architects, farmers, plumbers, busy executives—the average cross-section of an American community—can teach some of the Air Force men for whom they work a few things about planes. The AAF has made its ground observers plane-conscious in a big way. Visit any observation post and you'll hear, instead of what Mrs. Proctor told the minister at the Larsons' party the night before, something about a plane with “an inverted gull wing with a negative dihedral” or “four Rolls-Royce in-line motors” or another with “short, stubby motor nacelles, a swept-back leading edge and a fixed tail wheel.”

It's no passing fad. These civilian volunteers really know their ships. This one really happened: The commanding gen-

eral of one of our fighter wings journeyed to a small town to present aircraft recognition diplomas awarded for completion of a five-day course to civilian observer students, most of whom were barely able to distinguish between a fighter and a bomber before they took the course. After the ceremony the general stopped to chat a moment with several observers standing around a table full of plane models of all types. At random the general pointed to a ship, turned to a woman nearby and queried her politely as to the type of ship it was.

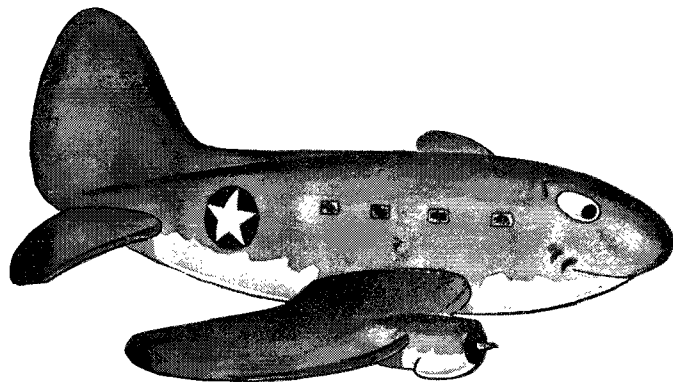
“It's the Halifax,” she replied without hesitation.

The general smiled, softened his voice as he corrected her, “Don't you mean a Lancaster?”

“No, General,” she said with all the assurance of a woman and a civilian, “that's a *Halifax*.”

“I'm sorry,” the general persisted, “I'm afraid we'll find it's the Lancaster.” They turned it up to read the small printed name underneath. It was the Halifax.

All this has come about since the beginning of the year. Air Force recognition officers, trained at Orlando's AAFSAT or at the 4th Fighter Command headquarters in California, were sent to all filter areas in the fighter wings where they set up recognition schools complete with the latest teaching aids; these included individual sets of flash cards, posters, pictures, slides, projectors, recognition handbooks and everything else an imaginative instructor could dream up. This was the acid test, for it was in these schools they would attempt to teach civil-



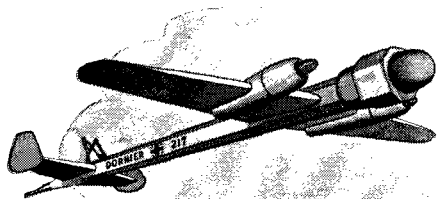
C-46—whale with wings.

ians in *five days* what it had taken them weeks to master.

To the schools come civilian observers—one representative from each observation post in a particular filter area, thirty to forty in a class, a new class each week until all the posts have been covered.

Surprisingly, the majority of the students are men—business men, farmers and professional men, who have had to arrange their affairs to take a week off to attend the Army school. Some, however, are housewives; some are mothers who have left the task of cooking Sonny's breakfast with their husbands while they learn about Focke-Wulfs and Heinkels.

The instructor, usually an officer, and two enlisted men who assist in the enrollment, teaching and motion picture projections, comprise the school's faculty. Classes begin at 0800, sharp. Each Monday morning the officer faces a new group of eager, ambitious observers. "My name is Underwood," he may say. "Our business here is war." And the school is on.

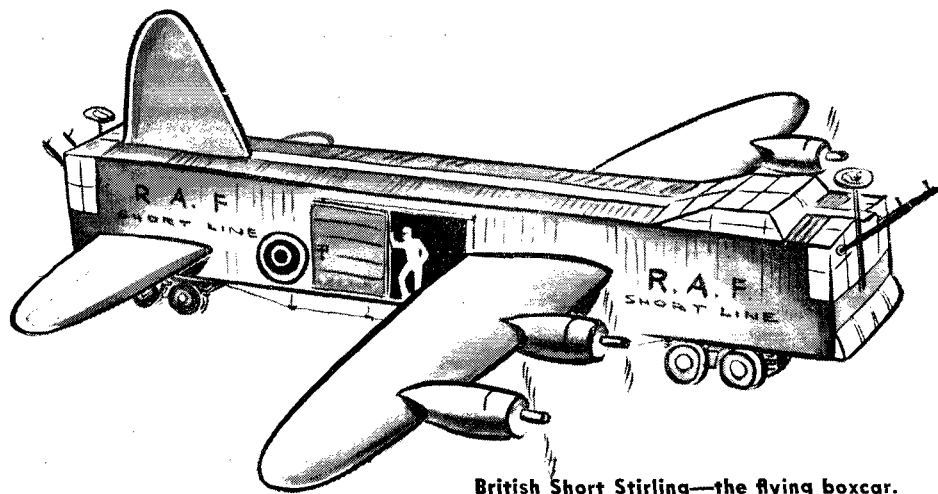


**Dornier 217—the flying pencil.**

For the next five days and nights these students don't know what hit them. The instructor doesn't pull any punches with these volunteers. He gives it to them straight and fast.

From 0800 to 1800, with a ten-minute break in the forenoon and afternoon and time out for lunch, they get planes, planes and more planes. Fifty-four different ships, more than ten new types a day—fighters, bombers, trainers, transports, Army ships, Navy ships, the enemy's—wing span, trailing edge, horsepower, fin-and-rudder. Dinner, shop talk. Then they have the evening off for play or study. Nobody plays. Most of them go back to the classroom for an informal session, more slides and silhouettes, and a thousand questions to ask the instructor. Later, in their own rooms, they look at flash cards until all the ships become just so many spots before tired, red-rimmed eyes.

The teaching method used is a modified—or slowed up—form of the Renshaw flash system. If, at the end of the course, these civilians know their planes at 1/10th of a second, it is considered satisfactory. There are no holds barred on the type or number of tricks an instructor may use to make his students learn their planes. The more stories, combat yarns and dramatic episodes he can dig up about the planes in question, the better. Association of ideas is also good. Students remember the Stirling because

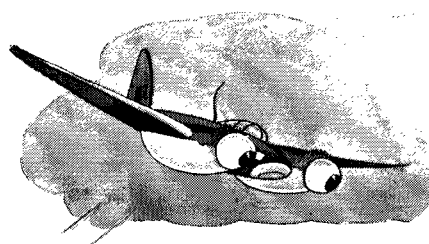


**British Short Stirling—the flying boxcar.**

it resembles a flying boxcar; the Commando, because it looks like a whale. The L-type is a grasshopper, and the Avenger they learn as TBF (two beers free; this is a natural because of the barrel-like fuselage, and the vertical fin and rudder resembling the stein).

If anyone who attends these classes had an idea this week-away-from-home was going to be a picnic, he is quickly disillusioned. For the vast majority of these students this is the first formal classwork they've had since they left high school or college so many years ago they'd rather not talk about it.

The first two or three days are the hardest. Up to Wednesday night, everyone in the class is sure he's going to fail. By Thursday, when the observers are up to their 42nd plane, they begin to see a faint glimmer of daylight. By Friday night, they've made it. They've passed



**De Havilland Mosquito.**

with flying colors. Saturday morning: graduation. Usually there is an unrehearsed flash-test demonstration for the visiting high-ranking officer who delivers the commencement speech. And finally come the diplomas, signed by the commanding general of the fighter command certifying they have met the AAF requirements in aircraft recognition and are now full-fledged civilian "recognition officers" for their particular post.

Almost without exception there's a party. In exactly one week's time there has developed between these people, regardless of age, creed, profession or nationality, a fraternal feeling that will bind them together for the rest of their lives. No Rotarian ever greeted another with the back-slapping that Fred Meacham from

Class One gets when he meets Joe Turner from the same class some six months later.

A fourteen-year-old boy was sent to a recognition class in California to represent his post. In Maine, a 78-year-old woman who walks three miles three times a week to keep her watch on her OP was sent to the school. An Adirondack guide made a seven-mile trip on snowshoes in the dead of winter to get an auto to take him to the train for Syracuse where he attended the initial recognition course there. A woman student in a west coast class received a telegram one morning that her son had been killed in action. She continued her school work. "My son would want me to carry on," she explained.

Whatever they did before they came to the school, however large their bank balances, whichever side of the tracks they live on, the great common denominator is the conviction with all of them that they are part of the Air Forces, that regardless of the cost in time and effort, they are doing something the Army considers necessary to the efficient functioning of the Aircraft Warning Service.

As they leave the school, each brand-new "recognition officer" takes away with him a huge packet of teaching aids: handbooks and flash-cards for every observer on the post. Once home, their *real* work begins: teaching aircraft recognition to every observer on their respective posts, numbering from 50 to 250 students. School is again set up in an available room, schedules are worked out with day and evening classes to accommodate everybody, and the fun begins. Classes are staggered over a four-to-six weeks' period, the objective being to give each observer at least ten hours of actual instruction in recognition.

When all the observers in a filter area have completed this training, the fighter wing is ready to give the new aircraft reporting system the green light.

Does it work? The answer is an unqualified "Yes." Enough time has now elapsed since the initiation of the new

method in many of the fighter wings to evaluate results. They have far exceeded the most optimistic hopes of AWS officers. By instructing the observers in one eastern area, for instance, not to report three clearly recognizable plane types, more than 6,000 calls a day were eliminated from the filter center. The ships on the observers' "negative" lists naturally would vary in different wings according to the preponderance of specific types in the neighborhood of certain aircraft plants and AAF fields. The 1st Fighter Com-

mand estimates that more than fifty percent of their "plots" will eventually be eliminated with this system.

When the observer spots an aircraft of the type in question and the ship is sufficiently low and sufficiently close to the post so there is no doubt in his mind that it is a P-47, for instance, he merely "logs" it in his official observation post record, but he does not phone the report. If the plane is too high to be clearly seen, or if he's not yet sure about the type, a report is made to the filter

center and the flight is plotted in the usual manner. By this screening process, by greatly reducing the number of flights plotted on obviously friendly planes, the accuracy of the remaining plots (which would naturally include any hostile craft) is proportionately increased.

Teaching aircraft recognition to the AAF Ground Observer Corps is no longer a dream. It has been done. Once again the members of this corps have proved they can take anything the Army can dish out. And like it. ☆

Swing your fifties over these and let go, scoring five for each bulls-eye. One hundred is perfect; ninety, terrific; eighty, good; seventy, fair, and sixty, passing. Any less and you need to brush up on your mental gunnery. Answers on Page 56.

**14. In a one-minute turn, the bank is maintained at**

- a. 45 degrees      c. 60 degrees
- b. 30 degrees      d. 25 degrees

**15. A parachute pilot is**

- a. A pilot who bails out too quickly
- b. A small auxiliary parachute
- c. A pilot with the Airborne Command
- d. A member of the Caterpillar Club

**16. When walking with a civilian, military personnel should always walk to the left.**

- a. True      b. False

**17. The MIG-3 is**

- a. An American tank
- b. An Italian dive bomber
- c. A Russian pursuit plane
- d. The Navy designation for the A-20

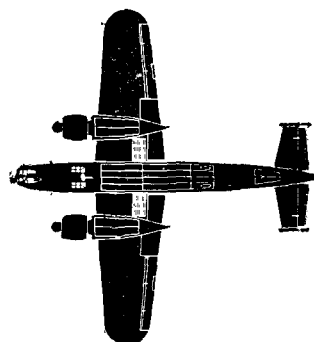
**18. The British Air Marshal is equivalent to what rank in the AAF?**

- a. Flight Officer
- b. Major General
- c. Colonel
- d. Lieutenant General

**19. The number of feet in a nautical mile is**

- a. 6080.2
- b. 5280
- c. 5820.6
- d. 5000

**20. Identify this plane:**



**1. Fifty caliber guns on the P-47 total**

- a. Six
- b. Eight
- c. Five
- d. Seven

**2. The present location of the 14th Air Force is**

- a. England
- b. North Africa
- c. China
- d. India

**3. The Beaufort scale estimates**

- a. Air Speed
- b. Wind velocity
- c. Altitude
- d. Rate of climb

**4. Paramushiro is**

- a. One of the Japanese cities bombed by General Doolittle
- b. The main Chinese stop on the India-China run
- c. A Jap stronghold on the northern tip of the Kurile Islands
- d. A key American base in the Aleutians

**5. What is the WEFT system?**

**6. Fill in the missing letters to complete names of AAF planes**

- a. Liber\_\_\_\_\_.
- b. Must\_\_\_\_\_.
- c. Comm\_\_\_\_\_.
- d. Mitch\_\_\_\_\_.

**7. The military designation for the DC-4 is**

- a. C-87      c. C-78
- b. C-54      d. C-47

**8. Which word is out of place in the following grouping?**

- a. Chandelle
- b. Reversement
- c. Immelmann
- d. Resonance

**9. Identify this insignia:**



**10. Barksdale Field is located in**

- a. Texas
- b. California
- c. Louisiana
- d. Florida

**11. Differentiate between absolute ceiling and service ceiling.**

**12. A williwaw is**

- a. A nonrotating device for producing alternating current
- b. An electrode having openings through which ions may pass
- c. Pigeon English for an airplane
- d. A sudden violent gust of cold land air

**13. The approximate range of the B-24 is**

- a. 2500 miles
- b. 4000 miles
- c. 3500 miles
- d. 3000 miles

# TRAINING AIDS



**I**F your bomber cracks up in mid-ocean and you and your crew take to life rafts, the man who is worth more than a million dollars to you is a good radio operator. This is the theme of a new training film (TF 1-3310) produced by the AAF First Motion Picture Unit, Culver City, Calif., and billed as "Radio Operator." The film's purpose is to help attach to the radioman the importance he deserves and to orient the student operator to a job that can become the most vital one among members of a bomber crew.

John B. Hughes handles the narration and begins the film with a news broadcast, which dissolves into the story of Recruit Joe Donahue. Highlights of the story are told in the accompanying photos taken from the film strip.

Joe reads the sign (1) as he passes through the gates at Scott Field and remarks, "They shouldn't count their operators before they hatch." Still unim-

pressed, Joe begins his classroom work and one day cuts his finger while tinkering with a life raft radio transmitter (2). A companion tells him to take it easy and learn because someday he might be happy that he can repair such a set.

"Keep sending," they tell Joe as he practices for hours on end (3). "Keep sending even when your finger is so numb you can't feel the key. Keep sending until you're sure your message has been received."

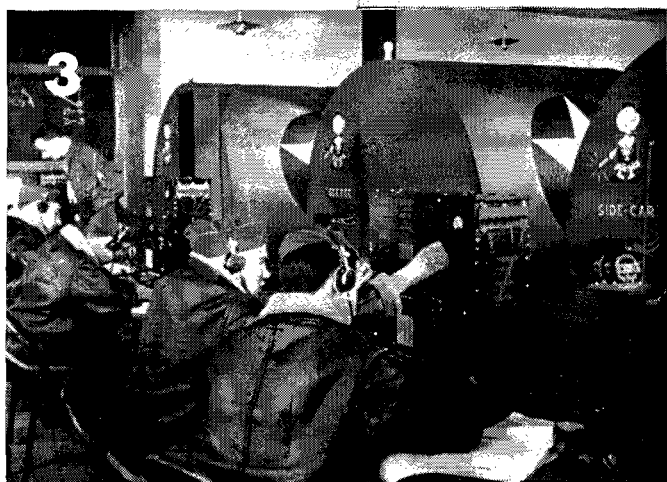
Joe feels better when he finally gets assigned to a B-17 and, as the bomber is primed for a take-off, Joe gets busy with his instruments (4). He is nervous and his voice cracks. The tower operator mocking Joe's voice cracks back: "Relax, Donahue, relax." Joe does.

Then come routine flights, one after another, until one day the pilot informs his crew over the interphone that they have taken off under sealed orders and

are on their way across. The crew members grin and slap each other on the back (5). That night, out over the ocean, trouble develops. "Fire in number four," the pilot shouts (6) and the crew members prepare for a crash landing. Joe notifies all vessels in the vicinity. The bomber hits the sea (7) and the crew scrambles for life rafts (8) to get away from the sinking plane. Joe has kept his head, brought his life raft radio set with him. He takes the transmitter from its wet, torn case and discovers it's on the blink.

Hour after hour, Joe works with the set (9), and the thirsty, sun-blistered crew members grow short-tempered. Suddenly, Joe cuts his finger on the transmitter, just as he did back in school, and he is reminded of an important adjustment. He works feverishly with the set, finally borrows a companion's shirt to make a kite for the antenna and starts sending.

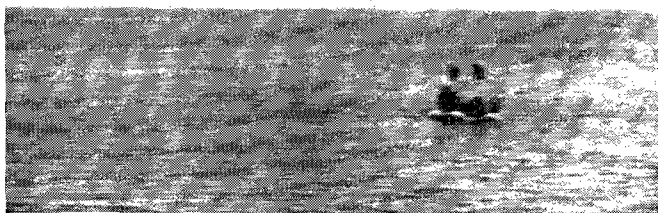
It works. They hear a plane and then after a few anxious moments, they see it heading toward them. The crew members yell and wave (10) until they're certain they've been spotted. As the rescue plane comes in for a water-landing (11), Joe kisses his radio. The film ends with a Roll of Honor. On it is the name of Joseph Donahue, radio operator. ☆



# RADIO OPERATOR



11





# SYNTHETIC DEVICES

INFORMATION on the availability of synthetic training devices may be obtained

from the AAF Training Aids Division, Park Ave. and 32nd St., New York City.

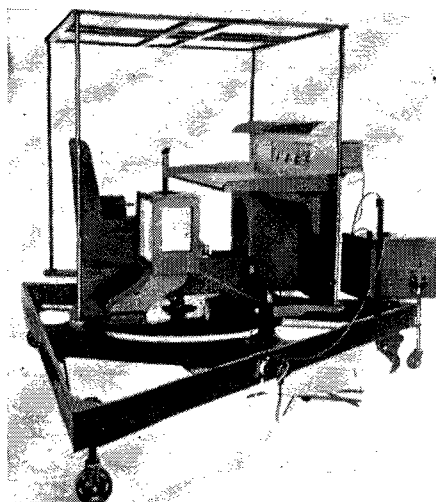
## Stereoscopic Viewmaster

THIS device is designed for recognition and range estimation training. It provides stereoscopic views or "three dimensional" pictures of the major friendly and enemy operational aircraft.

Approximately eighty airplanes constitute a set. Each airplane is displayed on a "reel" disc. Seven views of each plane are covered including those from the front, side and 45-degree angles. Six different sky backgrounds are used on the discs, three of sky colors and three of clouds.

Reflector sight rings superimposed on the planes are used for the range estimation. The ranges vary from 100 yards to 600 yards. A typical "reel" is one of the

B-17 showing this bomber in various attitudes at ranges of 400, 205, 600, 216, 132, 123, and 136 yards.



## Navitrainer

THE Type G-1 Navigation Dead Reckoning Trainer, more commonly known as the "Navitrainer," is a compact device supported on a triangular moving base. Problems in dead reckoning navigation may be simulated and the results recorded.

The Navitrainer is composed of three main assemblies: the navigator's car, triangular frame and the windroducer. The navigator's car contains the plotting table, drift meter, compass and other flight instruments. The car is totally enclosed by a canopy and is mounted on the frame, which moves in any direction and travels at a speed proportionate to the air speed

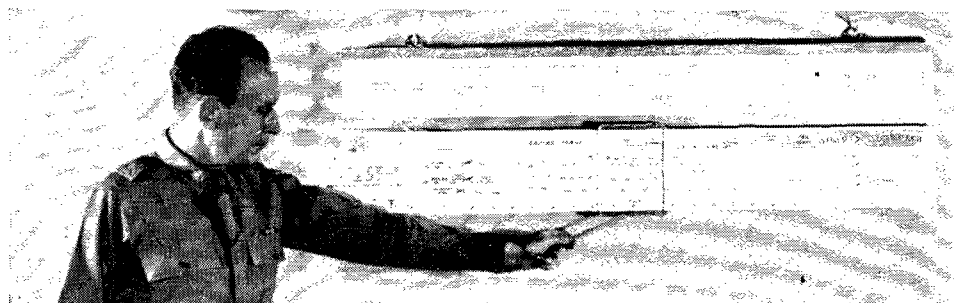
## Giant Load Adjustor

THIS training aid is a large, exact reproduction of the slide rule type of load adjustor used for determining quickly and accurately the proper loading of a combat or cargo airplane for safe and efficient balance during flight.

Load adjustors and the giant mock-ups

are made for specific plane types and models where loading situations of crew members, fuel oil and cargo must be quickly computed for center of gravity determination.

The Giant Load Adjustor is used for demonstration and instruction in classrooms. This device is ASC issue.



of the simulated airplane. The windroducer serves two functions. It introduces wind direction and velocity, and it supports a chart or map that is used as a reference for determining the simulated airplane's position or course of travel.

An instructor, who exercises supervision through an externally located instrument control box, can introduce drift and control the readings on the other instruments.

This equipment operates from a standard AC light outlet.

## What They're Reading

### HERE'S LOOKING AT 'EM

THE long-awaited pictorial recognition manual (FM 30-30) is out. A joint Army-Navy publication, it is made up in loose-leaf form so that as new planes come into service pages can be prepared and inserted and as planes become obsolete existing pages can be removed without revising the entire publication.

In its present form, the manual describes some eighty operational aircraft—American Army and Navy, British, German, Japanese and Italian. One page is devoted to each plane, and each page contains recognition and performance data condensed into short paragraphs, head-on, side and top drawings and silhouettes, and four aerial photographs.

In addition, the introduction includes sections on aids and methods for recognition training, names and letter designations of various planes, a glossary of terms and a set of scaled plane silhouettes which show at a glance comparative sizes of different aircraft.

### RECOGNITION TRAINING

INSTRUCTIONS for the AAF Method of Recognition Training" is exactly what its title implies—instructions for teaching recognition of planes, vehicles, and ships, and for employing the equipment on which successful teaching by that system depends.

It is planned to include a copy of the pamphlet with each set of equipment, primarily for the benefit of those using the equipment for instructional purposes. The pamphlet, however, gives enough of the idea behind the method to be of interest to anyone concerned with the problem of successful recognition instruction.

The pamphlet also includes plans for a simple flash shutter which can be made at any post or station.

Editor  
AIR FORCE Editorial Office  
New York, N. Y.

Stuttgart, Arkansas  
Squadron 25, S.A.B.

Dear Sir:

I am now enlisted in the Army Air Forces as a glider pilot trainee. Before entering the Army I was employed as a laundry executive, having spent two years at the Ohio Mechanics Institute studying the laundry business.

Since I have been in the Army, I have found that there is no laundry service on many posts or the laundry service offered is inadequate to meet the needs of the men. As a result, many men attempt to wash their own clothes. They have no knowledge of how the job should be done and usually either ruin the clothes or end up with them as dirty as when they started. Many of these men give up after two or three attempts and throw underwear and socks away when they become too dirty to wear. I have seen this happen so many times that it occurs to me that there must be a tremendous waste of clothing throughout the armed forces plus a lot of men who would be healthier and much more comfortable if they knew how to launder their clothes properly.

Sincerely yours,  
(signed) Staff Sgt. Arthur H. Brown

**S**ERVICEMEN are all apt to find themselves stationed, sometime or another, at a post that never heard of a laundry. Although we moan and groan there is no way to get our clothes cleaned except to wash them ourselves. We postpone the job as long as possible but, finally, we get down to that last clean pair of shorts and something must be done.

Washing your own clothes is not nearly so disagreeable as you might imagine, especially if you have some knowledge of how to go at it. There is a definite satisfaction in turning out a good clean job.

Let's suppose that we have the one pair of shorts left and have decided to wash all the dirty clothes we have stored up. Carrying them to the washroom, we hope there is hot water available, for it will make the work much easier. Cold water will do, but a little more elbow grease will be required to shake the dirt loose.

Before washing the clothes, we separate them into different groups. Colored materials should never be washed with white because the colors often run. Also, never wash very dirty clothes with those that are only slightly soiled. The dirt will be transferred to the cleaner pieces.

The easiest and safest method of doing clothes is to wash each type of garment separately. In other words, wash all underwear together, all colored socks together, all white socks together, all handkerchiefs together and so on.

Use the washtub if there is one available, otherwise use two wash bowls. A large cake of GI soap will be needed. However, a package of granulated soap (one that is recommended for home washing machines) will make the job easier because it will dissolve more readily in the water.

Fill the tub or bowl with enough water

to cover the clothes to a depth of two or three inches. The water should be slightly hotter than lukewarm and should be prepared before the clothes are put in, so that any garments containing wool will not be shrunk by getting under the hot water faucet.

After the clothes have been put into the water add enough soap to keep at least

If you are using two washbasins, you can have a batch of clothes soaking in one while you work in the other. There is, however, no benefit derived from soaking clothes more than fifteen minutes.

The clean clothes should be wrung out and hung to dry. Squeeze water gently from all garments containing wool because wringing will damage the fabric. Sunlight has a sterilizing and bleaching action, so your clothes will be whiter and purer if they are dried outside.

If you find handkerchiefs hard to get clean and slightly slippery, soak them in salt water for an hour before washing.

Now let us summarize the "Do's" and "Don'ts" of this washing business and you can go to work.

1. Separate your laundry into the various types of garments before washing, being sure never to wash colored work with white.

2. Mix each basin of water before putting in the clothes.

3. Maintain at least half an inch of soapsuds on top of the water during each sudsing operation.

4. Dry garments in the sun whenever possible.

5. Don't attempt to wash clothes under running water, such as in basins without stoppers or under showers, because for good washing it is necessary to build up a concentration of soap in the water itself and this is impossible when fresh water is constantly being added. ☆

## HOW TO WASH YOUR CLOTHES

*By Staff Sgt. Arthur H. Brown*

half an inch of suds on top of the water at all times. This is very important because the soap has two functions: the first is to loosen the dirt from the clothes; the second is to keep that dirt suspended until clothes are removed. As soon as that layer of soapsuds disappears from the top of the wash-water, the dirt begins to settle back into the garments.

This dirt, however, is held by a layer of lime soap. (Lime soap is the same sticky substance that made the ring around the old bathtub.) Most of the poor laundry work turned out in camps, especially that with a brownish tint or black greasy specks, is the result of having insufficient soap *dissolved* in the water.

If a washboard is not available, scrub your clothes by rubbing them between the hands. A scrub brush can be used on very dirty pieces but it is not recommended for most work. Two suds and three rinses are the minimum for a good clean washing.

To service combat units of the Army Air Forces  
at all times and under any conditions  
regardless of the difficulties encountered

# THE ROLE OF THE SUB-DEPOT

*By Lieut. Col. Arthur V. Jones, Jr.*

**COMMANDING OFFICER, 29TH SUB-DEPOT,  
ENID ARMY FLYING SCHOOL, OKLAHOMA**

**T**HE slogan "keep 'em flying" has become a familiar sight and sound to Americans. Everywhere it is seen on banners and posters. It is heard as a radio greeting and sign-off. It has become a conversational by-word.

Let us examine the conditions that lie behind that short phrase. First and foremost is the apparent fact that superior air power makes possible a greater offensive power in this war. Air power, then, is a major factor in tactical planning.

The planning staff must first have a source of adequate supply of aircraft and parts. The second necessity is a system for the storage and issuing of these supplies, and for the maintenance, repair and reclamation of these aircraft.

The first problem is met by industrial expansion throughout the United Nations. The second is the function of the Air Service Command of the Army Air Forces.

The Air Service Command controls, handles and distributes all Air Forces property throughout the world. It also conducts repair, maintenance and reclamation of all U. S. military aircraft.

In the continental United States, these activities are coordinated through eleven control area commands and control depots, and then through the lowest domestic ASC echelon, the sub-depot.

**S**ERVING every Army airbase and flying training school is an Air Service Command sub-depot. Command is vested in an Air Service officer who is responsible to the station commander (on other than Air Service Command stations) in matters of post administration only.

In addition to his technical knowledge of the activities of his sub-depot, the thorough CO keeps a finger on the personnel pulse of his organization.

The fundamental precept of personnel

management — knowing one's employees — was never more true than in the sub-depot set-up.

It is of utmost importance that the commanding officer "get around" the shops, the warehouse and the hangars and keep in close touch with his people.

The sub-depot that is run entirely from the cushioned chair in the commanding officer's headquarters office cannot be the alert, vigorous organization it should be.

Nearly all domestic sub-depots are operated by civilian personnel administered by officers of the Army Air Forces. A sub-depot at a training base, such as the Enid Army Flying School, will employ several hundred civilian employees and be staffed by a small corps of officers. (Of course, very few civilians are used in combat areas.)

The sub-depot exists for one purpose. That purpose, briefly stated, is to do everything within its power to keep the aircraft flying and in combat fitness.

The aggressive sub-depot commander will place his services at the disposal of the flying organizations of the station 24 hours a day and seven days a week. He should make certain that the sub-depot is never called upon at any time of the day

or night that it cannot perform the service required. To accomplish this end the sub-depot commander has three major departments; supply, maintenance and signal.

The maintenance department is organized and equipped to perform all second echelon airplane maintenance and as much of third as lies within its space and equipment limitations.

**I**t can perform major repair of aircraft and any assembly thereof, except engines. It operates extensive shops for all types of wood, metal, plastic, leather and cloth manufacture and repair. It operates the parachute unit and performs all second echelon inspection and maintenance.

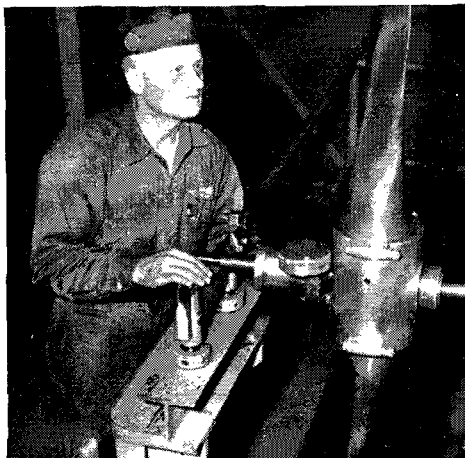
The maintenance officer is the final authority on the base in regard to technical matters pertaining to aircraft. He maintains a technical order compliance system and aids the station technical inspector and organization engineering officers in their efforts. It is his duty to take the objective view and offer aid to any organization, whether or not the problem is brought to him.

By a consolidation of daily aircraft status reports he is able to keep close check on all station aircraft.

In most every case there is no ordnance officer on the sub-depot staff. Ordnance requirements and servicing are handled by the air force or the command which operates the airbase or airfield on which the sub-depot is located. This differs from overseas operations wherein the air depot group, or mobile miniature of a control depot, has an ordnance section attached to its headquarters and headquarters squadron. Also in overseas operations, the air service group, or mobile miniature of a sub-depot, gets its ordnance servicing and requirements from its own supply and maintenance squadron, which includes ordnance specialists.

The sub-depot is responsible for furnishing the station all supplies and equipment peculiar to the Air Forces,

**Clyde Smith tests a prop for absolute static balance at Enid, Okla.**



(The motto appearing at the top of this page is that of the 59th Sub-Depot, Lowry Field, Colo.)

maintaining an adequate replacement stock and expediting the shipping and receiving of more than 15,000 items.

It is the duty of the supply officer to anticipate demands upon his stock resulting from changes in aircraft types assigned to the station, from seasonal changes, from operating conditions and from normal rates of consumption.

He has funds which are available for the local purchase of necessary supplies that are not available through normal supply channels.



**John E. Wright, blacksmithing for the 20th Sub-Depot, Coffeyville, Kan.**

The signal sub-section, whose parent unit is the control depot signal section, is responsible for the storage and issuing of all items of Signal Corps equipment used by the Air Forces and assigned troops. It installs and maintains all ground radar and fixed ground communication equipment, performs all necessary service and maintenance of airborne radio, radar and navigation equipment used by the Air Forces. This section supplies replacement sets and maintenance parts for such equipment.

In technical matters pertaining to the installation of signal equipment in airplanes the signal officer is responsible to the maintenance officer. In administra-

tive matters he is, as are all department heads, responsible directly to the sub-depot commander.

If the sub-depot is to function at utmost efficiency, the officers heading each department should be able to look beyond their own units and understand the problems confronting their fellow workers.

To accomplish this end a plan was effected at the 29th Sub-Depot which is saving hundreds of man-hours each week by placing vital supplies at the place they are needed most at the time they are needed, on the flying line and in the shops. The system entails the services of a liaison man who is well informed on

**This lowest domestic Air Service Command echelon serves every Army airbase and flying training school with one purpose — to keep U.S. military planes in the air, wherever they are flown.**

maintenance supply problems.

Functioning as a trouble-shooter, the supply coordinator receives all not-in-stock requisitions as they are returned to the maintenance department. It is his duty to ascertain whether or not an error has been made in the nomenclature or stock number. If the requisitioned merchandise is truly not in stock, he notifies the foreman who placed the order as to when he may expect the merchandise.

After receiving this information, foremen often find it advisable to make substitutions rather than hold up production.

Before this system was instituted every foreman was responsible for the follow-through on his orders. This resulted in

much time lost both for the supply department because of frequent interruptions and for the foremen who were forced to be away from their departments to check on undelivered merchandise.

A major and vitally important function of the sub-depot is the training department. A course in foremanship is attended by all supervisor employees. Lectures in safety practices and first aid are a requirement for all employees. Up-grading is fast in these days of dwindling manpower and a progressive educational system is vital.

The training supervisor, a civilian with a background of teaching administration and organization, maintains a reading room and library of technical books, obtains training films and coordinates with local off-the-post schools, and state and national organizations featuring adult vocational education programs.

The sub-depot safety engineer functions largely as a technical advisor to foremen and top management. He is also qualified to recognize the existence of health hazards. He studies causes of absenteeism, keeps records and makes reports on all injuries.

At the 29th Sub-Depot, daily inspections are made by the safety engineer during which safety suggestions are gathered from foremen and employees. At the end of each month a detailed report is made to the commanding officer. Safety hazards, suggestions for corrective action, accident classifications and frequency and severity statistics are included in his report.

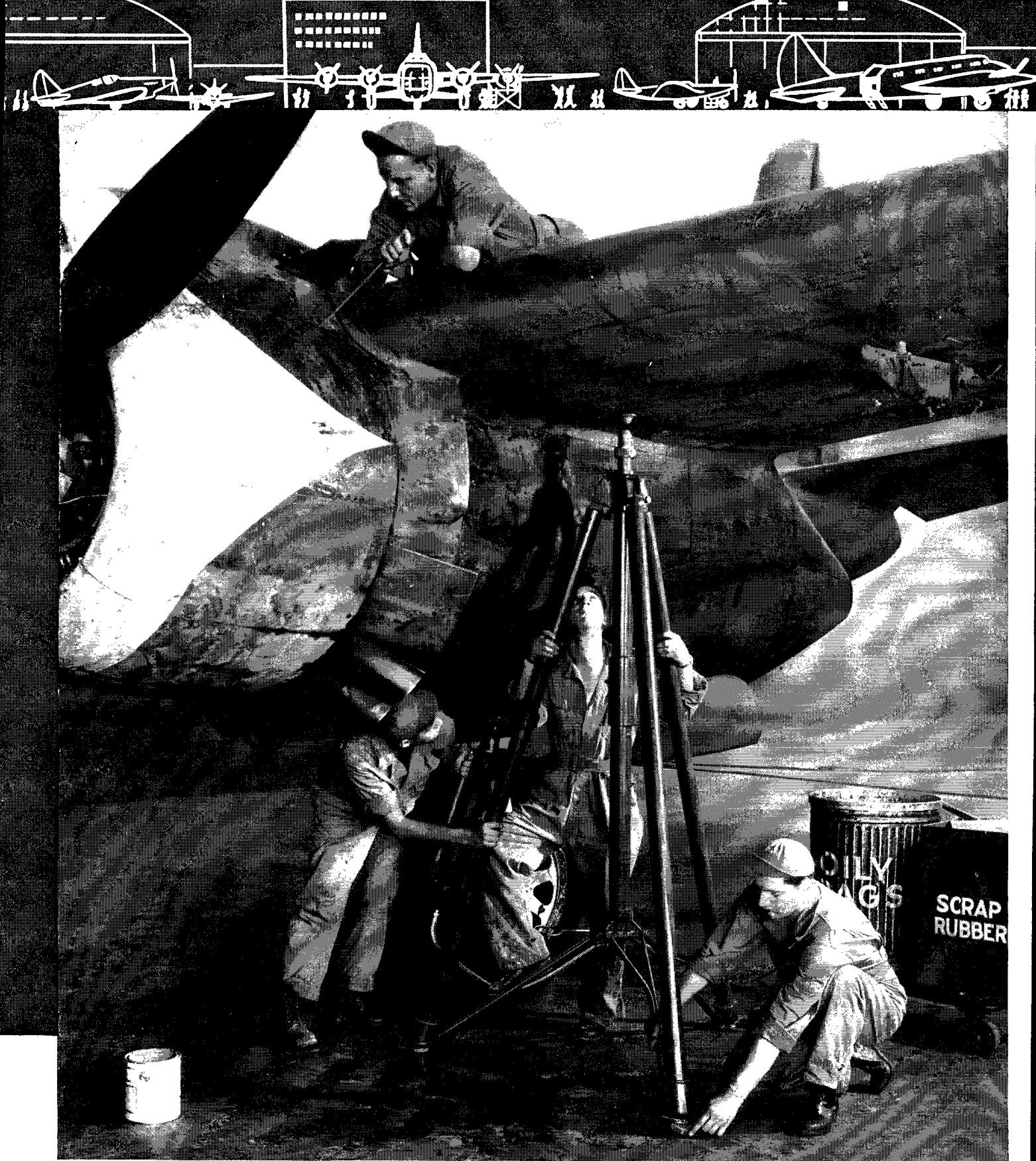
THE aggressive action of the 29th Sub-Depot safety engineer has resulted in the enrollment and subsequent training of forty 29th Sub-Depot employees in a special safety training course sponsored by the War Manpower Commission and presented as a 96-hour night school course by the state university.

Chief among the unsung heroes of any organization are such behind-the-scenes men as janitors, building repair men, equipment alterers, carpenters and freight handlers.

At most sub-depots this work is done through the station engineers. In order that these tasks may be accomplished with greater speed, a utilities and plant maintenance department has been created at the 29th Sub-Depot.

Headed by a utilities supervisor, the personnel of this department form a labor pool which is capable of performing almost any task with the greatest economy of time. He may also "borrow" skilled and technical assistants from other departments.

This department works closely with the station utilities department for in many instances repairs and alterations cannot be made until permission is granted from the station engineer or commander. ☆



## WHAT'S WRONG WITH THIS PICTURE?

**R**ALLY around, men, for another session of uncovering boners.

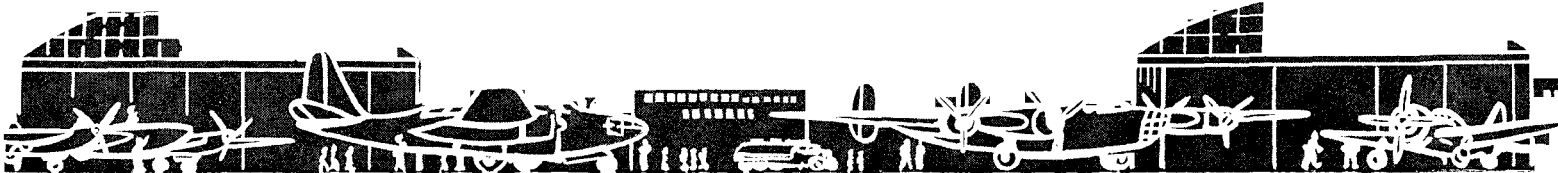
We all know there's a right way and a wrong way of doing everything but these mechs are jacking a plane the hard way. They might just as well have begun correctly and followed through, for valuable time is wasted by starting

incorrectly and then backtracking to patch up mistakes.

The men who posed this job in the blundering way are Cpl. Henry Dickens on the wing and (left to right) Pvt. Andrew Gilstein, Sgt. Clarence Schwake and Tech. Sgt. Chas. A. Petrou, all attached to Headquarters Squadron, ASC.

Sergeant Petrou can find eight mistakes in the picture. These are listed on Page 48. Do you see any that he missed?





# ON THE LINE

## IF YOU DON'T KNOW HOW, LEARN HOW . . .

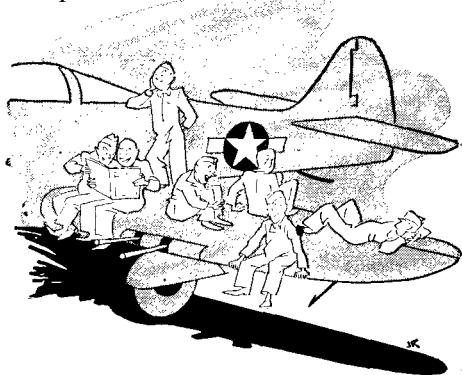
Frequently you stand watching an airplane take off into the skies. You've done this lots of times, haven't you? Now and then something of your own spirit soars with the craft as your eyes follow it away. You ought to feel pretty proud because you helped get that plane aloft. It's going on its mission in fine fettle, properly serviced. You did a good job.

When you didn't know how to tighten a hose clamp to the proper tension, you were smart enough not to do it until you learned the right way. Experienced mechs in each squadron are always ready to answer questions for new crew members. *Do it right or don't do it at all.* Don't slip up on the slightest detail. If in doubt, consult the proper TO. When you work on an airplane, give it your best. Mistakes that jeopardize the safety of pilot and crew are unpardonable.

These are the words of an AAF captain, still young after fifteen years as an enlisted man, who looks back with pride to the work he did **ON THE LINE** because he feels confident it was done the right way.

## DON'T BE A JERK . . .

Using a straight wrench, when an offset wrench is called for, to get on the nut squarely results in "rounding" the nut, barking your knuckles and wasting more time generally than would have been required by procuring the proper tool right off the bat. Incidentally the threads on a bolt or nut are stripped easily by jerking on the wrench instead of using a steady, even pull.



Sit under the apple tree,  
If you will, but not on plane wings.  
Men or obstacles shouldn't be up there.

## PAINT SHOP . . .

Just a reminder that your paint shop should be well ventilated at all times. It is a likely place for a fire to start. Essential fire-fighting equipment in necessary quantity must be ready at all times.

Repeatedly you are cautioned against spraying paint in a closed hangar. Just to keep this grave hazard firmly in mind, refer to TO 07-1-4.

## TAKE IT OFF . . .

Before each flight take a look at the exposed pistons of pneumatic shock struts on landing, tail and nose gear. They must be cleaned of ice, mud, dust or sand to cut down excessive wear on the strut and packings. Use a cloth saturated with alcohol as emphasized in TO 03-25-6.

## SHIELDED BEARINGS . . .

It is said that metal shielded anti-friction bearings with fixed seals are being oiled in some instances. TO No. 29-1-3 states that grease (specification AN-G-3) shall be used as the lubricant. The original grease is the only grease for the life of the bearing. Oil washes away the essential grease, exposes bearings to dust and grit. To say the least, this doesn't do the bearings any good.

## THINK THIS OVER . . .

Some planes fly week in and week out and never get a major write-up from the pilot. There must be a reason. And the reason is that they are serviced by you mechs who really know proper maintenance procedure.

## HERE YOU HAVE IT . . .

Mechs, we have but one job—to see that our pilots fly the safest possible airplanes.

## PUT 'EM BACK . . .

When tools are removed from a plane's special kit it is impossible to maintain the craft properly while on flights away from its home base. Reference: TO 18-1-26.

## SLIPPING ON SLIPPAGE MARKS . . .

Painting the prescribed slippage marks on tires makes inspection much easier. Also, failure to inspect tires for slippage will end up in the valve stem pulling out, causing tire and tube failure. Reference: TO 04-1-11.

**A monthly maintenance roundup prepared in collaboration with the Air Service Command and the Technical Inspection Division, Office of the Air Inspector.**

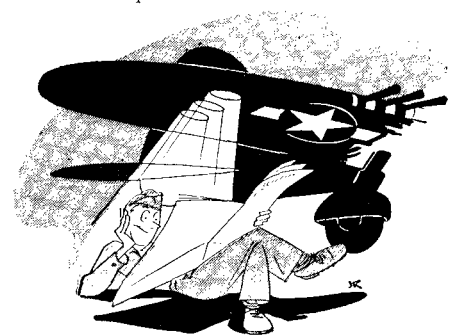
## FUEL LEAKS . . .

Fire, either in the air or on the ground, can start almost immediately from fuel leaks around the carburetor and primer system. Many such leaks are found, indicating that fuel systems are not being checked under pressure. Check fuel systems under pressure at the 25-hour inspection, according to the Airplane Handbook of Service Instructions.

## FIRE EXTINGUISHERS . . .

Do you have a date tag on all one-quart type fire extinguishers as stipulated in TO 03-45-1? Also, TO 16-20-1, paragraph 8-d directs that contents of CO<sub>2</sub> extinguishers should be stenciled on the cylinders in letters approximately an inch high. And, TO 16-20-2 states that the date it is placed in use be marked in three-quarter inch letters. Paragraph Six requires that an extinguisher be inspected every six months and date of inspection lettered on the cylinder.

Check WD Circular 261, 1942. A thorough and frequent system of inspection for contents of fire extinguishers will be instituted by post, camp and station COs to see they are filled with the proper fire extinguisher fluid and *not* with inflammable liquids. This is in addition to other inspections. ☆



Get a reading lamp, Buddy!  
Or those wing lights may fail when  
needed for a landing. See TO 01-1-61.

them between his hands. Then they take you to their plane, less than 200 yards away, and you head back to the Ephrata hospital and airbase. The hand is treated with sulfadizine ointment and bandaged. It didn't take long. The parachute drop was 23 minutes, 51 seconds, almost exactly what had been figured out theoretically before by personnel in the physics branch of aero-medical laboratory.

AND that was the jump I made on June 24. What I learned and what I would like to pass on to airmen who may be making a jump from such a height is theory no longer. I know, and the Air Surgeon's Office knows, for it received the complete account of the jump first hand as soon as it was possible for me to make a full report to Brig. Gen. David N. W. Grant, the Air Surgeon.

Here is what I learned.

Be sure to have bail-out oxygen equipment on all flights above 30,000 feet. When the parachute jerks open, the sud-

## Bailing Out at 40,000 Feet

(Continued from Page 25)



Colonel Lovelace has his equipment adjusted by members of the Boeing flight test department.

### MISTAKES IN "ON THE LINE" PICTURE ON PAGE 46 (Reading from left to right)

1. The belly landing made by the mech on the wing was an unnecessary emergency. Men and materials should not be on the wings during jacking. To loosen Dzus fasteners use a shorter screw driver and stand on a crew chief's stand. Pressure is needed, not just a twist of the wrist.
2. Somebody's going to kick the bucket—the one under the prop, to be specific. Such irrelevant objects cause sprained ankles and broken necks.
3. You wouldn't have to scrunch under the nacelle, Sergeant, if that jack were in position. Where you are now, one move and you'll bump your noggin against the cowl flap. The hydraulic pump should be on the foremost leg *away* from the plane.
4. Say, you standing behind the jack, take your right foot off the hose made of that rare substance, rubber, ere you ruin it. See TO 04-5-2.
5. No need to page Sherlock Holmes on this one—there's grease on the floor! Only a little bit, to be sure, but you might discover it too late to avoid an accident.
6. It looks as if that jack ram is not properly aligned under the jack pad. One slip and you'll ruin the wing. The jacking cone being used isn't the proper one for the jacking pad. A cone adapter is on instead of a spherical adapter which should be used. Reference: TO 19-1-18.
7. Bad business, putting that wooden block under the leg of the jack. Can't you see you're throwing the whole works off balance? Move the jack into proper position and don't attempt to doctor a wrong set-up by raising one leg.
8. And now, an old saying that can be followed advantageously ON THE LINE is: "A place for everything and everything in its place." In this instance it applies to the oily rags and scrap rubber receptacles on the cart, which obviously have nothing to do with jacking a plane. Keep your working areas clear of clutter.

den compression of the chest by the parachute harness forces all oxygen from the lungs. To start breathing again, you will need all of the oxygen you can get to refill your lungs. The bail-out bottle will take care of you.

In a large plane, a bail-out bottle is extremely necessary for without it you easily could lose consciousness before reaching the emergency exit of the plane.

To ease the shock of the parachute opening, you should fall free of the plane until your forward momentum is lost. This will lessen the jolt when the parachute checks your fall and you more likely will be able to retain consciousness.

The importance of retaining consciousness was emphasized ten days after I had made my carefully planned jump. One of Wright Field's test pilots was forced to bail out at 32,000 feet when the plane he was testing had a structural failure. The pilot did not have bail-out oxygen equipment so, before leaving the plane, he inhaled three deep breaths of oxygen. Then, holding his nose, he jumped out. After tumbling for 2,000 feet he began to feel fuzzy so he pulled the rip-cord and then lost consciousness as the parachute snapped open.

The pilot fully regained consciousness at 10,000 feet but was so weak from lack of oxygen that he could not control parachute oscillations or his landing, which resulted in back injuries.

With adequate oxygen, I was able to retain my strength and revive more quick-

ly from the unconscious period following the opening of the chute. Thus, I was able to handle myself upon landing.

For those of you who may not know, pure oxygen should be given to any person who has been exposed to a lack of oxygen. This should be given to the patient until his color returns to normal.

In the event of frost-bite of your hands, put them between your legs or under your arms or against any warm part of the body—but *don't rub them*.

In addition to these observations, I satisfied myself that the GI bail-out bottle contains adequate oxygen for jumps over 40,000 feet and that the oxygen equipment with which we have been working for the last five years will operate under extreme cold and low pressure conditions.

Preparation for this flight and jump was very detailed. While at Wright Field, I followed a simulated flight and parachute descent pattern in the pressure chambers of the aero-medical laboratory. On another flight, preceding the jump, a dummy was dropped on a parachute to ascertain the number of minutes the descent could be expected to take.

I had made three previous flights well over 40,000 feet—one piggy-back in a P-38. From these I found it to be easier to fly at high altitudes than to simulate such flights in a pressure chamber.

In the aero-medical laboratory at Wright Field, Lieut. K. E. Penrod conducted extensive physiological tests through simulated parachute jumps from various altitudes to ascertain what conditions I would have to withstand. Capt. Perry Thomas was largely responsible for the research and development of the mechanical equipment, including the cylinder and the means of metering the oxygen, which was a modification of the RAF system.

Colonel Lovelace began his oxygen research work in the Mayo Clinic in 1938. He previously had been graduated from the Randolph Field School of Aviation Medicine as a flight surgeon. Other medical education was obtained at Washington University in St. Louis, Harvard University, and University of Minnesota, from which he received the degree Master of Surgery. He now is president of the Aero-Medical Association of the United States.

As a civilian at the Mayo Clinic, Colonel Lovelace had a part in the development of the first practical production model oxygen mask—the BLB, from the initials of Doctors Boothby, Lovelace and Bulbulian. For this and other original oxygen research work by Mayo clinic scientists with Col. Harry G. Armstrong (former director of the Wright Field aero-medical laboratory), and the airlines, the Collier trophy was awarded in 1940, and Colonel Lovelace was one of those privileged to receive it from President Roosevelt. ☆



An orchid to the earth-bound operations officer. Tied to his desk by administrative responsibilities, he manages to thrive on worry and live for the day when he may spread his wings again and soar into the clouds of combat.

Even the "brass hats" are human in the AAF. Colonel Brown is needling Colonel Larkin about piloting their B-17 into a bumpy landing. Their conversation is amusing to the fledgling fighter pilots in the background who just caught hell from the CO for buzzing the field.



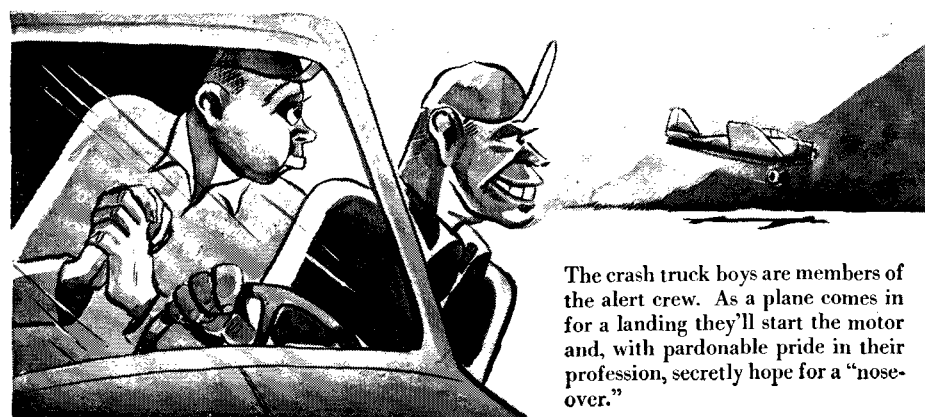
The forecaster is being very cagey about divulging secret weather information to the pilot who chooses to be likewise cautious about his specific destination. This kind of thing is likely to result in a temporary stalemate. They'll get together over a coke and a cigarette, however, and the pilot will be on his way, shaking his head over the forecaster's psychic power (or lack thereof).



The distraught dispatcher has his problems too. Through the din of teletype machines and the inter-com phone he manages to break the hourly bottleneck of air traffic. At the moment the line chief is checking with him on a missing parachute while an overdue pilot standing behind him is sweating out his clearance.



ATC Pilot Betts has just landed his transport and is offering a PX hot dog to passenger Clarence Calkins, civilian engineer. Having completed his first and probably last flight down the usually stormy coastline, Clarence will take the slow boat back to the States after completing his job at the base. Just now the hot dog is a bit revolting to Clarence.



The crash truck boys are members of the alert crew. As a plane comes in for a landing they'll start the motor and, with pardonable pride in their profession, secretly hope for a "nose-over."

# A MONTHLY RECORD OF DECORATIONS AWARDED TO PERSONNEL OF THE ARMY AIR FORCES

## MEDAL OF HONOR

**LIEUTENANT** Jack W. Mathis\*. **STAFF SERGEANT** Maynard H. Smith.

## DISTINGUISHED SERVICE CROSS

**LIEUTENANT COLONEL** Chesley G. Peterson. **LIEUTENANTS:** John J. Howell\*, Harold L. Pederson\*.

## DISTINGUISHED SERVICE MEDAL

**LIEUTENANT GENERAL** Carl Spaatz. **BRIGADIER GENERAL** Hoyt S. Vandenberg. **STAFF SERGEANT** Frank W. Bartlett (Also Distinguished Flying Cross).

## LEGION OF MERIT

**COLONELS:** Bartlett Beaman, Julian M. Joplin. **LIEUTENANT COLONELS:** Leighton I. Davis, Bradley J. Gaylord, Horace H. Manchester\*. **MAJOR** David M. Van Ornum. **LIEUTENANTS:** William F. Haizlip, Rocco Sansone. **MASTER SERGEANT** George W. Mitchell.

## SILVER STAR

**BRIGADIER GENERAL** Fred L. Anderson, Jr. **COLONEL** John E. Barr. **LIEUTENANT COLONELS:** John R. Alison (Also Purple Heart and Distinguished Flying Cross). **CAPTAINS:** Everett W. Holstrom, Mario F. Sesso. **LIEUTENANTS:** Bryan W. Brown, Zed D. Fountain, Vernon L. Head, Hazen D. Helvey, John E. L. Huse\*, Elwin H. Jackson, Ralph C. Johnston, Walter E. Lacy\*. **TECHNICAL SERGEANTS:** Clinton P. Merrell, Arvle D. Sirmans. **STAFF SERGEANTS:** Sam J. McGlaughlin, Jr., John D. Zealor. **SERGEANT** William P. Laplant. **CORPORALS** Riley J. Bryan, Jack W. Newton. **PRIVATE FIRST CLASS** Thomas S. Bartlett. **PRIVATES:** Donald A. Ward, Edward T. White.

## OAK LEAF CLUSTER TO SILVER STAR

**LIEUTENANT** Jack I. B. Donaldson.

## PURPLE HEART

**MAJORS:** Frederick Delaney, Jr. (Also Air Medal), John D. Lombard (Also Distinguished Flying Cross with Oak Leaf Cluster and two Oak Leaf Clusters to Silver Star), Charles W.

\* Posthumous

Marsalek\*. **LIEUTENANTS:** Irwin Foster, Thomas Frederick Lohr. **FIRST SERGEANT** Chancy M. Hills. **TECHNICAL SERGEANTS:** Leonard M. Fox, Jennings H. Palmer (Also Distinguished Flying Cross and Air Medal with 3 Oak Leaf Clusters). **STAFF SERGEANTS:** Edwin M. Breedlove, Anthony B. Cum, John T. De John (Also Air Medal), Nathan R. Gelber\*, Eber J. Neely, Robert D. Pannier, Stanley Poplaski. **SERGEANTS:** Hyman Bernstein, Nelson P. Reed. **CORPORALS:** Raymond H. Alsip, Clarence M. Hoehn, Marcellus B. Olmsted, James D. Robinson, Lonnie D. Wright. **PRIVATES FIRST CLASS:** James A. Horner\*, John T. Haughey\*, Marion H. Zaczkiwicz\*. **PRIVATES:** Jack A. Downs\*, Harry W. Lord\*, Ruby Prater, William S. Riley, Merton I. Staples\*, Walter D. Zuckoff\*.

## DISTINGUISHED FLYING CROSS

**LIEUTENANT COLONEL** Frank Dunn. **MAJOR** Dill B. Ellis (Also Air Medal). **CAPTAINS:** Curtis B. Caton\*, Frank C. Church. **LIEUTENANTS:** John L. Cronkhite (Also Air Medal), Fred G. Henry, Hulet C. Hornbeck (Also Air Medal), William W. Martin, Stephen Poleschuk (Also Air Medal), Robert L. Ramsay, Jr. (Also Oak Leaf Cluster to Silver Star), Walter T. Schmid (Also Air Medal). **FLIGHT OFFICERS:** George M. Pearce, William H. Rogers. **MASTER SERGEANT** Norman L. Biehn. **TECHNICAL SERGEANTS:** Edwin R. Isaac, Mahlon E. Leed, Wallace E. Odneal. **STAFF SERGEANTS:** Forrest M. Adams, Henry F. Arts, Jr., Jesse D. Bergquist, Fred M. Clark, Guy W. Clary, John D. Cox, Gillman W. Gilbertson, Walter W. Keck, Lloyd J. Mahan, Leroy M. Norgan, Coleman A. Robinson, Kenneth G. Wagoner. **SERGEANTS:** Rex A. Applegate, Robert J. Gaines, Robert W. Mader, Charles P. Pamrowski, Wallace E. Smith (Also Air Medal). **CORPORALS:** George H. Behrens, Frank L. Bonito, Carl H. Firchau, Owen H.

Golden, Walter R. Green, Ferdinand Milisci, Dennis Murray, Marvin D. Swenson. **PRIVATES FIRST CLASS:** Gerlad J. Bogacki, Charles L. Coury, Jacob J. Deyarmond, John P. Hawley, Marcellus Lampe, Louie E. Philpot. **PRIVATES:** Cyril H. Arnzen, Dell C. Drawdy, Joe S. Gallagher, Conrad H. Kopperud, William G. Latteman, Carl L. Milberger, Gilbert L. Runnels, Royce L. Shepherd, John M. Swenson. **FORMER AVG MEMBER** John E. Petach, Jr.

## OAK LEAF CLUSTER TO DISTINGUISHED FLYING CROSS

**MAJOR** Albert J. Baumier. **CAPTAIN** Thomas J. Lynch. **LIEUTENANT** Anthony C. Yenallavage.

## SOLDIER'S MEDAL

**TECHNICAL SERGEANT** James D. Warrington. **SERGEANT** Floyd R. Hudgens. **TECHNICIAN FOURTH GRADE** Frank A. Derosa. **CORPORAL** Charles H. Reynolds.

## OAK LEAF CLUSTER TO SOLDIER'S MEDAL

**MASTER SERGEANT** Joseph D. Healy. **SERGEANT** Hendrik Dolleman.

## AIR MEDAL

**COLONEL** Cecil E. Combs. **LIEUTENANT COLONEL** George E. Schaezel. **MAJOR** Harley C. Vaughn (With Oak Leaf Cluster). **CAPTAINS:** Charles N. Bannerman, John E. Barrett, John E. Bartlett, Clayton J. Campbell, Clement V. Charbonneau, Charles J. Hoey, Robert E. Kimmel, Henry P. King, John L. Lambert (With Oak Leaf Cluster), Richard W. La Roque, Harold J. Larson, John Carter Legg, III, Kenneth L. Lucke, Irving Paul MacTaggart, Henry M. McAleenan, Samuel B. McGowan, Laidler B. Mackall, Frank Leslie Martine, John W. Miller, Mitchell J. B. Mulholland, William E. Mullin, Albert Nowak, Elmer L. Parsel\*,

Thomas E. Peddy, Paul M. Person, Maurice V. Salada, Harold D. Schmoldt, John H. Shaw, Pete C. Sianis, Donald A. Simpson, Glenn W. Sorensen, Edward F. Stoddard (With Oak Leaf Cluster), Howard K. Teague, Arthur H. Tuttle, Jr., Sachse Wallace, Cyrus A. Whittington, Cloyd Woolley. **LIEUTENANTS:** Robert J. Art, Paul R. Badger, Bernard L. Barber, James R. Barbour, Carl H. Barton, Charles R. Cook, Walter H. Coons, R. S. Couture (With Oak Leaf Cluster), Gerard J. Creamer, Charles W. Crisler, Jr., William S. J. Curley (With Oak Leaf Cluster), Charles Clifton Cutforth, Lawrence J. Daly, Jr., Edward L. Daniels, John D. Davenport, Thomas C. Day, Clyde E. DeBaun (With Oak Leaf Cluster), Julian A. Dickey (With Oak Leaf Cluster), John M. Diffley, Stephen P. Dillon, Joseph E. Disalvo, Jacob Wylie Dixon (With Oak Leaf Cluster), Anthony Donabedian, John R. Downswell, Cecil C. Duncan, Edgar H. Dunn, Jr., Harold E. Dymont, Eugene B. Ellis, Sherman E. Ellis, William J. Emerson, John W. Emmons, Thomas W. Ferebee, Paul Griffith Ferstle, Rocco A. Franchi, Howard W. Fraser, John H. Frick (With Oak Leaf Cluster), Joseph Ernest Fuszek, Charles F. Gallmeier, John A. Gallup, Kenneth Gaynor, Victor J. Giles, Joe D. Gillon, Jr., Otto Goldsteinn, Theodore H. Gorton, Robert L. Gould, Eugene E. Greeson, Silas M. Grider, James A. Grigsby, James M. Hair, Dan G. Hann, Clarence L. Harmon, Ralph Daniel Harrison, Everett E. Haskell, Jr., William D. Hector, George G. Hedblom (With Oak Leaf Cluster), William L. Heldt, Delbert R. Hetrick, Alvin J. Hill, Morcy L. Hodgman, Kenneth W. Holbert, Gaylord D. Holmes, John J. Hood, A. T. House, Jr., Carl H. Houseworth, William T. Humphries, Jr., William Hunter, John H.

Ijams, Jr.\*, Joseph R. Irvin, William G. Ivey, Harold M. Jaffe, Frederick R. Jenks, Wayne S. Johnson, John C. Johnston\*, Joseph P. Johnston, Garret J. Jones, Jack Jones\*, Randall L. Jones, George W. Jordan, Duncan G. Kaye, Albert W. Kellams, Eugene E. Keller, Glenn R. Kraus, Paul R. Ladd, Jesse W. Lankford, Jr., Sumner P. Lapp, Jack L. Laubscher, Glen V. Leland, Jr., Edward Leroy Leonard, Rex E. Lewis, William C. Lewis, Sumner E. Locke, Raymond Lucia, Gordon M. MacLeod, Claud McAden, Howell P. McCorkle, Charles S. McCune, John J. Mackey, Morris E. Mansell, Jr., Sidney L. Miller, James W. Moore, James P. Morgan, Robert E. Nelson, Charles Gard Oliveros (With Oak Leaf Cluster), Thomas C. Parkinson, Samuel J. Parks, Seymour J. Ponemone, Clifton K. Pool, Dale B. Prescott, Jack Donald Pritchard, John G. Rankin, Frank S. Rathbone, Jr. (With Oak Leaf Cluster), William E. Read, Percy W. Robinson, James P. Rogers, Claire M. Smartt, Francis David Schroth, Jr., J. F. Segrest, Jr., Lee Roy Senter, Rodney Nelson Sheain\*, Joel M. Silverman, Paul J. Slocum, Sidney Slotoff, Nathan Sutin, Grant Swartz, Thomas K. Taylor, John J. Testa, Downey L. Thomas, Jay T. Thompson, Jr., Harold R. Townsley, Peter Val Preda, Sylvan H. Viner (With Oak Leaf Cluster), Brent F. Walker, William P. Walsh, Jr., William T. White, Jess O. Winkle, Jr., Russell S. Wilkin, Aime J. Wood, Jr. **MASTER SERGEANTS:** William J. Dabney, James H. Daddysman, Alpha G. Storey, Joe L. Wilderman, Elmer R. Wyckoff. **TECHNICAL SERGEANTS:** William E. Andrews, Phillip H. Arnaud, Richard V. Arrington (With Oak Leaf Cluster), Kenneth W. Baldrige (With Oak Leaf Cluster), Rex W. Barada (With Oak Leaf Cluster), Glen Beard, Harold V. Brooks,

John W. Buck, Francis X. Caulfield, John T. Durden, Roland E. Gates (With Oak Leaf Cluster), Raymond B. Hoke, Jr. (With Oak Leaf Cluster), Clarence V. King, Joseph G. Marcelonis, Jack G. Richardson, Bensing Webster. **STAFF SERGEANTS:** Frank G. Antosz (With Oak Leaf Cluster), Forest W. Bertsch (With two Oak Leaf Clusters), Clarence K. Blend, William Herrington Bosworth, Joe Bowles (With Oak Leaf Cluster), Charlie B. Brown, Howard A. Clarke (With two Oak Leaf Clusters), Solomon Cohen, Charles P. Chalcraft, William Joseph Everhard (With two Oak Leaf Clusters), Julius A. Foster, George H. Fowler, Jr., Wilford O. Gaines, William J. Pash, Walter J. Polinski, William M. Prull, Charles S. Savoini, Walter S. Sloan, Charlie O. Smiley. **SERGEANTS:** Jack Belk, Nick Bober, Henry P. Bobinski, Raymond Gerald Boucher, Arthur N. Bouthillier, Lloyd A. Burkholder, Joseph M. Caserta, Ernest B. Clark, Claude E. Cockrell, Beryl R. Candick, Edward J. Czekanski, Herman W. David, Walter S. Deahl, Warren J. Ewing, Joe G. Ferrero, George Fry, Michael Geroik, Morris W. Hancock, Robert E. Hawkins, Durwood W. Hitchens, Chester A. Martin, Horace E. Moore, Chester H. Oliver, Ralph O'Neill, Paul E. Price, Richard Reading, Robert L. Rice, Thomas B. Roberts, John F. Rose, Daniel O. Ruttiger, Howard J. Ryerson, Richard F. Schnorr, Leo W. Shelton, Jack P. Thomas, George H. Townsend, Richard W. Troxell, Thaddeus J. Wallace, Edward B. Wisnowaty. **CORPORALS:** Paul M. Drossel, Robert W. Harrington, John W. Melvin, Donald J. Morris, George L. Pohlig. **PRIVATE FIRST CLASS:** Willard R. Madison. **PRIVATES:** William I. Hall, Charles Jimmick, Charles E. Martin, Michael D. Mazzeo. ☆



Lt. B. L. Barber



Capt. R. E. Kimmel



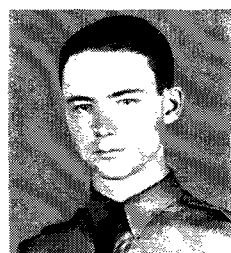
Capt. Henry P. King



Major A. J. Baumler



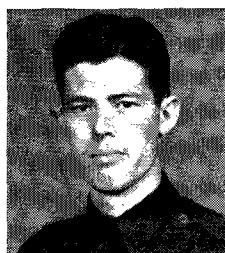
S/Sgt. Wm. J. Pash



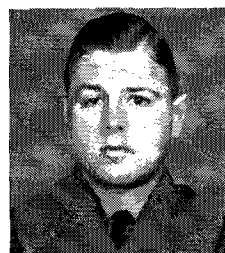
Lt. W. J. Emerson



Capt. Albert Nowack



Lt. J. A. Grigsby



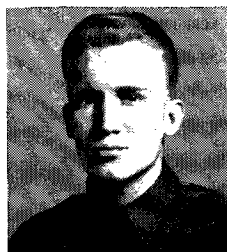
Lt. C. F. Gallmeier



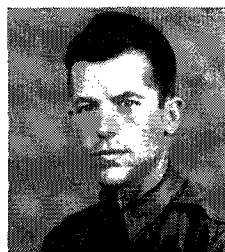
Lt. Clyde de Baun



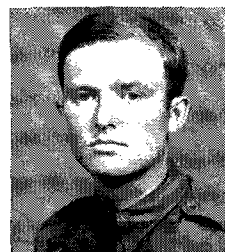
Col. J. M. Joplin



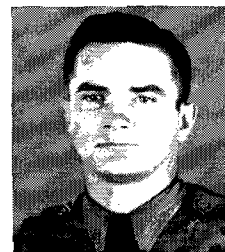
Lt. James M. Hair



Lt. Jack Donaldson



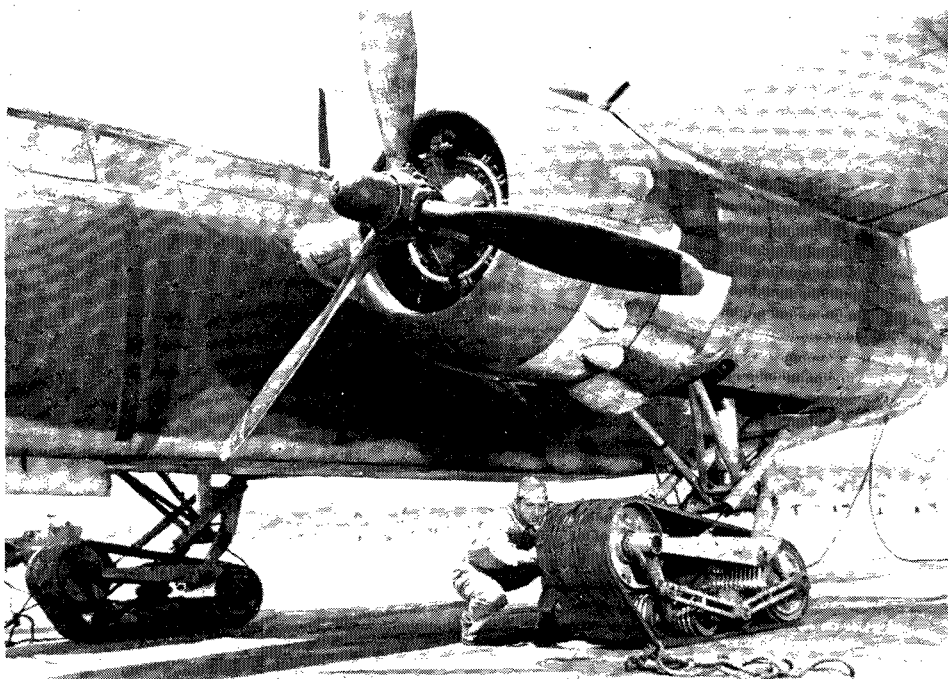
Lt. J. R. Irvin



Lt. Clare M. Smartt







### Caterpillar Landing Gear

A caterpillar landing gear, which may be the forerunner of new-type landing gears for large aircraft, has been successfully tested by Wright Field engineers. It is the first ever built for aircraft in the United States.

The increased footprint area provided by the rubber track will enable heavy planes to operate from soft ground or deep sand which is impossible for present aircraft with conventional tire-wheel landing gears. Such a gear, for example, would make it possible for the giant 62-ton B-19 to land on any airfield instead of being restricted to concrete runways.

The new landing gear is constructed with steel bracing and grooved aluminum bogey rollers. An air spring partially cushions the landing impact. The rubber track has a circumferential wire beading and is grooved to fit into the roller grooves, thus preventing side-slippage.

On large aircraft this type of landing gear would save weight and would be easier to retract than such tires as the 96-inch ones of the B-19.

Landing characteristics of the A-20 with the caterpillar tread are the same as with the ordinary tricycle gear.—**Lieut. R. V. Guelich, Wright Field.**

constructed in collaboration with Capt. Ralph J. Gross, base operations officer, enlisted men of the navigation plotting section and workmen of the 46th Sub-Depot.

Actually there are four separate boards but placed side by side on the wall they give the appearance of a single board. The boards in order are Inbound, On Base, Outbound and Destination Arrived. The On Base and Destination Arrived boards are each twenty inches wide, while the other two measure forty inches each. Overall height is 45½ inches.

On both the Inbound and Outbound boards there are six columns, at the top of which are hooks where hour indicators are hung. Each column is sub-divided into thirty slots, numbered consecutively from top to bottom at two-minute intervals from :02 through :60. This two-minute calibration of each hour is believed to be sufficiently accurate for recording ETA.

Hour indicator strips for the top of each column are numbered consecutively from 00:00 through 23:00. Only twelve of these strips are needed because both sides are used, the numbers on the two sides of each being six hours apart. At the end of a six-hour interval it is only necessary to turn over the hour indicator strips to make the board ready for the next six hours of operation.

In this system colored cards in various shades are used, each color representing a particular type of plane. For example, salmon represents a B-17; tan, B-25; pink, B-24; pale blue, A-20; buff, B-34; canary, A-29; dark blue for scheduled airlines and cargo planes, and white for all others.

The 4-inch by 6-inch cards are used on both sides—one side for the Arrival Record, the other for Departure. Three-fourths of an inch of the card protrudes at the top when it is in position in its

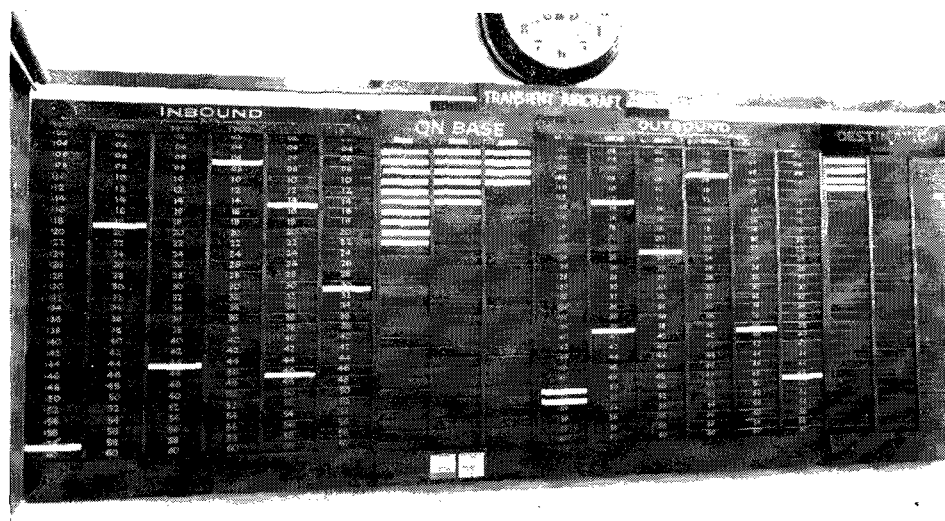
### Transient Aircraft Traffic Board

A new and improved transient aircraft traffic board has been developed at the Houlton (Maine) base of the North Atlantic Wing, Air Transport Command. The board is capable of handling complete data on as many as 180 inbound and outbound flights on a single wall of a small room and has been in satisfactory use for several months. A glance gives a quick visual reference on all transient plane movements to or from the base.

It replaced the conventional blackboard used in most operations offices, which in the same space could list only twenty or thirty flight plans, and has greatly simplified the work of operations clerks.

The new system was conceived by Col. James A. Ellison, base commander, and

A convenient new Transient Aircraft Traffic Board.



slot on the board. The following data is recorded on the arrival side of this portion: date, serial number, type, pilot, from, departure, ETA, arrival and parking position. On the lower section of the card, which does not show when it is in the slot, are two divisions—schedule and crew. Facts under "schedule" include: arrived from, home station, mission and remarks. Information on the "crew" side is pilot, co-pilot, navigator, radio operator, flight engineer and others.

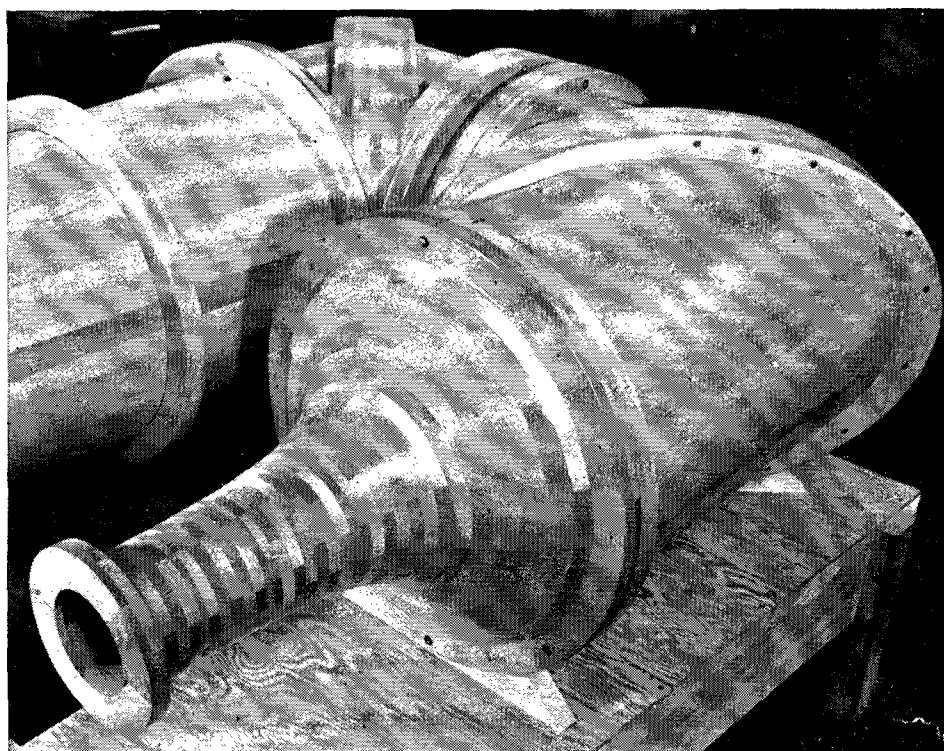
The departure record on the opposite side of the card lists across the top: date, serial number, type, pilot, to, departure, ETA and arrival. Under "schedule" is given: to, mission, per authority, cleared by and remarks. "Crew" information is similar to that on the arrival side.

With this system it is possible by glancing at the board to get a complete outline of information on any and all inbound and outbound traffic, as well as on all planes on the base. At the end of the day the cards are filed according to date making them readily available for reference. One card gives complete information on any craft, making it unnecessary to search through a stack of bulky flight plans. The file requires a minimum of space.

While the board is simple for the operations worker to understand, it may appear complicated to casual visitors in the office, who do not know what the colors represent and can not get close enough to the board to read any information from the cards.

Flexibility is a feature. An adaptation would fit almost any particular situation at any base. The board can be readjusted easily to record the status of planes, weekly or monthly aircraft movements, movements of planes to specific bases or any other special uses an operations officer might wish to apply.

Gone forever at the Houlton base are the days when operations clerks were straining to write on the top lines of unsightly blackboards and attempting to wipe chalk dust from their hands, hair and uniforms.—**PRO, Air Force Base, Houlton, Maine.**



**Wooden model of the new 600-mile-an-hour wind tunnel under construction at Wright Field. The model is built to a scale of one to twenty.**

### **Powerful New Wind Tunnel**

Designed for testing models of high altitude bombers and fighters, a funnel-shaped, ten-foot wind tunnel which will generate winds reaching a velocity in excess of 600 miles an hour at a temperature as low as 67 degrees below zero is being constructed by the AAF Materiel Command at Wright Field.

The tremendous velocity will be made possible by using two 20,000 horsepower motors to drive the huge fans and by tapering the tunnel from its maximum cross-section to a minimum diameter of ten feet at the throat where the blasts will reach their highest speed.

Temperature and pressure conditions found at altitudes ranging from sea level to 50,000 feet will be simulated in the new tunnel. A monster storage-type refrigerator system can reduce the tempera-

ture of the wind as it roars through the tunnel to 67 degrees below zero.

Supplementing the work of the familiar twenty-foot tunnel which in its period of operation to date has won wide acclaim, the new tunnel will permit tests of an entirely different nature, including icing and winterization experiments.

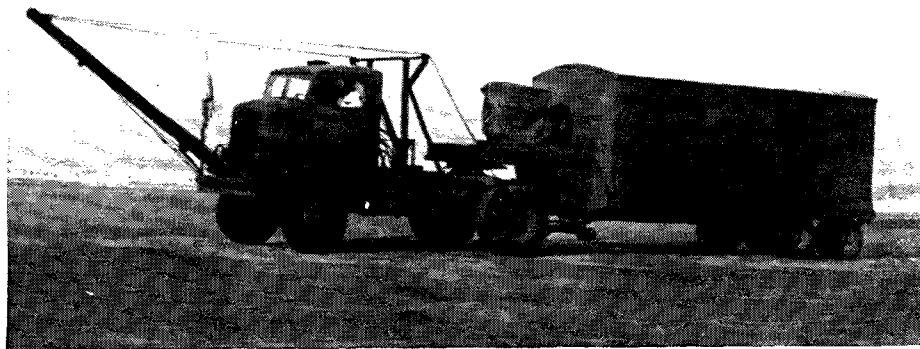
The twenty-footer is an atmospheric tunnel, highly valuable in testing aircraft and component parts under simulated sea level conditions. It was not designed, however, to reproduce altitude pressures or temperatures and as a result such conditions cannot be controlled in it.

The constant increase in speed of planes at higher altitudes has required the installation of the new structure. The new testing tunnel will be built in the shape of a long, narrow rectangle of the closed return type.

Its operation at a vacuum of less than

### **ALL-PURPOSE CRASH TRUCK**

To take care of crashes occurring at points away from base, a mobile crash unit has been assembled by Capt. George Saltzgeber of the 333rd Sub-Depot at Grenier Field, N. H. The unit permits crash crews to handle a wreck at the scene eliminating trips back and forth. The crane has a lifting capacity of 3,500 pounds at a 30-degree angle and is hand operated. Mounted on the trailer platform is a gasoline-driven generator and air-compressor unit.—**Capt. L. C. Martin, Assistant PRO, Grenier Field.**



one-eighth atmospheric pressure, approximating pressure conditions found at 50,000 feet, is one of the engineering features of the tunnel.

Important aircraft modifications necessitated because of high altitude operations, addition of armament, changes in cowlings and other alterations exert a direct influence on the speed of planes and on changes in aerodynamic characteristics. Since many such modifications made on the Army's planes originate at Wright Field, a wind tunnel capable of testing models of planes and parts suitable for high altitudes will be a boon to the work of the Materiel Command.

The refrigeration system, housed in a separate building, will contain a cold chamber for testing equipment at minimum temperatures. The four doors of the chamber weigh more than four tons each and measure 25 by 25 feet.

A series of cooling coils will regulate the temperature of the air as it speeds through the tunnel. To simulate conditions found at 50,000 feet the air is chilled to sub-zero temperatures as it passes over the coils and by the time it reaches the throat of the tunnel drops to a temperature of 67 degrees below zero. The tremendous decrease in temperature at that point is due to the lowering of air pressure as the speed of the air is increased upon reaching the narrow throat. Refrigeration engineers estimate that this minimum temperature can be held for an hour or more before the cooling process need be repeated.

Before an actual test is run it will be necessary to chill the cooling coils with vast quantities of calcium chloride brine solution. This solution is brought to a temperature of forty degrees below zero by means of two huge compressors before being circulated through the coils. Twenty hours are required to complete the job.

The newest and fastest of the Army's wind tunnels will be constructed of steel plate varying in thickness from  $\frac{3}{8}$  to  $1\frac{1}{4}$  inches. The two 20,000 horsepower motors will drive the counter-rotating fans, each of which measures nineteen feet in diameter. The fan blades, made of wood, are being fabricated at Wright Field. Control equipment governing the twenty-foot tunnel will also be used for the new project.—**T. A. Berchtold, Wright Field.**



**Maj. Robert E. Reed and the emergency tourniquet system he has devised for his flight coveralls.**

### Tourniquets On Flying Suits

A simple method of safeguarding the

lives of combat crews who may be injured during missions has been devised by Maj. Robert J. Reed, 8th Air Force pilot. With a pair of scissors, some heavy ribbon and six dowel sticks he has equipped his flight coveralls with six emergency tourniquets at vital artery pressure points on arms and legs. Pencils may be used instead of dowel sticks if necessary.

This is how they are used. Suppose the ball turret gunner has been hit in the arm by a shell fragment and is bleeding profusely. Quite often no one can come to his aid while the fight with the enemy continues, so the gunner, using his free arm, reaches into his breast pocket and pulls out a dowel stick. A heavy ribbon, previously sewed into the upper arm of the flying suit, already encircles his arm. About three inches below it is a loop that also has been sewed or cut into the suit.

Taking the dowel stick, he slips it between the ribbon and suit and twists it as a tourniquet until the blood flow is stopped, then pushes the lower end of the stick through the loop on the sleeve and anchors the tourniquet. Besides safeguarding his own life by halting the flow of blood, he also can man his guns or, if they have been knocked out, can help other crew members at their posts.

This same application is possible on the legs, either below the knee or on the upper thigh. By releasing the tourniquet every fifteen minutes, clotting is avoided.—**Wright Field. ☆**

### AAF Power Gliders

The AAF Aircraft Laboratory has developed an engine installation for the CG-4A glider that can be mounted in one hour. The engines, one for each wing, are 130 horsepower air-cooled Franklins which actually are package power plants. Gas tanks and instruments are carried in the engine nacelle.

The power glider, known as the XPG-1, is slow and has a limited range. When empty it can take off and fly under its own power, and when loaded it can extend its range after being released from the tow plane, thus giving the pilot more choice in selecting a landing spot, as well as enabling faster cargo service between bases.—**Wright Field.**



to the contribution "B"-40 pilots made to our situation in the China-Burma theatre. During the spring of this year, the Japs made a determined effort to clean up the Assam-Burma frontier and destroy certain of our installations which we very much wanted right where they were. What stopped them was the stuff dropped three or four times a day by swift little planes which appeared as if they had a bad case of goiter.

Below the railhead at Myitkyina the "B"-40s indulged in a game called "threesies"—blowing up one large bridge and then two smaller ones, one on either side. By the time the poor Nips got the little ones repaired so they could work on the big one, similar damage had been

## THE 'B'-40 OVER BURMA

(Continued from Page 5)

done to several other points along the line. Supplies just never reached the Jap troops who needed them and the monsoon finds our foul-breathed friends right back where they started—but tired and sadder.

By now practically all the pilots in the fighter group which fostered the "B"-40 have mastered the technique of dive-bombing with the 1,000-pounder, but there's still the six-man first team which, literally, has never gone after a target and not destroyed it. For aspirants to his varsity, Colonel Barr, who recently received the Silver Star for his work with the 1,000-pounders, has laid down a set

of rules. He has taught his boys a definite pattern based on a method of target approach that is meticulous in its detail. Like a well-coached football team, the pilots follow the pattern—day after day after day.

Out here it's taken very much as a matter of course and frequently A-3 has trouble deciding whether to send the B-25s or the "B"-40 after some particular target. The only people who retain their astonishment—except, perhaps, the Japs—are the pro-Allied Naga headhunters of northern Burma who have had some very close views of our work. They speak of the 1,000-pound-bomb-carrying P-40 as "the double-airplane-which-drops-half — BOOM!" ☆

## BASE OASIS IN NORTH AFRICA

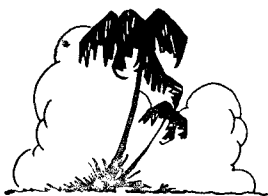
**A**IRMEN get fed up at times with all work and no play. And there are comparatively few opportunities for recreation at an airbase in the field in North Africa.

But one B-26 squadron worked out a solution by building a "community center" out of odds and ends of available scrap material. It's not as finished as the average club in the States, but it's a



The exterior of this squadron's recreation center in North Africa is decorated with the rudder of a fallen Messerschmitt. The interior view is typical. Note the phonograph at left.

By **Lieut. SNOWDEN T. HERRICK**  
NORTHWEST AFRICAN STRATEGIC AIR FORCE



howling success just the same. The club-room was put together in only two days after Maj. Richard B. Polk, squadron CO, started the ball rolling. Lieut. Robert O. Hauser, navigator, calling on his pre-AAF experience as an architect, did a great deal of the necessary procurement and supervised the construction. The squadron carpenter, Master Sgt. Frank Peters, a full-blooded Iroquois, took care of the carpentry.

Wood for the building, which came mostly from packing boxes used for fragmentation bombs, was collected after an

unrelenting search. Heavy beams and posts served originally as crates for heavy equipment. Tents and tent flies made a neat waterproof roof.

The structure is portable and the squadron fondly hopes to pack it along if and when it moves to another location. The lumber alone makes the building precious in the land of few trees.

The club is furnished in good taste with a bar in one corner made of metal linings salvaged from ammunition boxes hammered flat and pieced together to make a smooth surface. The usual odds and ends

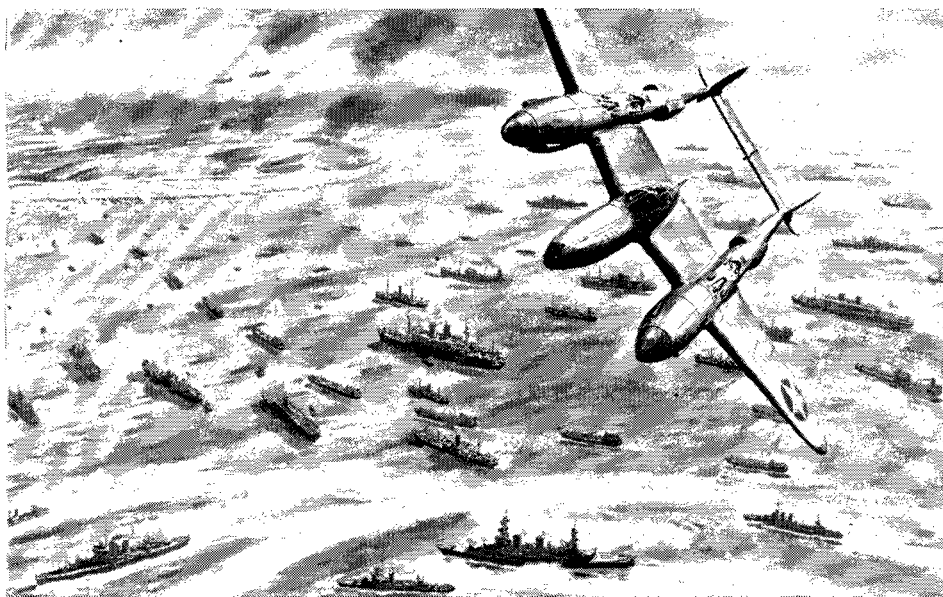
of wood served as the bar framework.

A modernistic ceiling lamp was procured at a nearby native town. Most of the chairs are the nail-less, woven straw variety which the Arabs invented to satisfy European seating customs. The card tables are homemade.

The club has proved so profitable under the management of Lieut. S. A. Kaufman that cigars, cigarettes and even candy are on the house. The supply problem is sometimes difficult. Because of this uncertainty the "bartender" is often forced to serve water straight.

On one occasion the pilots, navigators and bombardiers brought in some Coca Cola syrup. They refuse to reveal the source, except to say that the syrup came from a long way off. The soda water they had been saving as a mixer had disappeared the previous night, but the cokes tasted OK mixed with plain water. ☆





This is Illustrator Noel Sickles' conception of a portion of the Sicilian landings. The drawing was done on the basis of intelligence reports and on-the-scene accounts. More than 3,000 surface craft participated.

## THE LUFTWAFFE AT BAY

(Continued from Page 7)

Once we had established ourselves, we began to team closely with the advancing ground armies—our task as part of the tactical air force. The principles involved in this operation had been employed successfully in the Tunisian campaign, and now that we were putting them to use for the second time the job came much easier and, if anything, it was performed more efficiently.

In addition to protecting our ground forces from threats of air attack, we flew strafing missions against ground targets—enemy tanks, artillery emplacements, troop concentrations and supply routes. The major share of this particular task, however, was carried out by the fighter-bombers—A-36s, bomber version of the P-51, and the P-38s and P-40s—for which we usually flew cover.

Just as in the North African campaign, there was complete cooperation between air and ground forces in the battle areas. And the lessons learned in Tunisia paid dividends in the advance of our forces in Sicily.

From our standpoint in the tactical air force, the lack of anything even remotely resembling the air opposition we encountered in North Africa made our part in the operations easier to carry out in most respects. Lack of opposition, how-

ever, can be a dangerous thing in offensive operations, and it caused more than little concern in the earlier stages of the Sicilian drive. When you encounter steady opposition, you have something on which to base your plans. Without it, you must determine where and when the enemy intends to concentrate his limited air. Otherwise, your superior force can be seriously crippled if it is spread too thinly—which it is almost sure to be without a careful analysis of the opposition's possible moves and the proper application of your own decisive air power. In addition, with nothing in the skies to fight most of the time, pilots unconsciously adopt a false sense of security and become careless unless they are continually prodded to keep alert. A fighter pilot should always remember it's the guy you don't see who knocks you out.

THE enemy pilots we met over Sicily no longer had the same fight, the same skill and the same training that they had demonstrated over Western Europe, or even Tunisia. Our group had seen this tailing-off quite clearly weeks earlier in intercepting enemy bombing raids on our occupation forces in Pantelleria. At that time, flights of from ten to twenty fighter-bombers, escorted by fighters, would come in on a raid, and the moment we engaged them in combat they would try to break away and head for home. They seemed to be panicked in their scramble to avoid a fight. We shot down 28 FWs and MEs in two and a half days, with a loss of only two of our fighters.

This reluctance to fight can be attributed in no small degree to the superiority of the Spitfire over the best of the German fighters. We knew we could fly rings around the enemy, and it didn't take him long to discover the same thing.

As far as our group was concerned, enemy fighters were always on the defensive. Another factor was the lack of experienced leaders on most of the enemy missions. Even on the occasions when a good leader was participating, the other pilots seemed to follow him around the sky like a flock of geese.

We have every reason to believe that many of the planes which raided Pantelleria, and later Malta, were operating from the same field we eventually occupied on Sicily. One of the more convincing pieces of evidence discovered at the Sicilian base was a carefully drawn topographic map of Malta found in the operations office. Such details as the location of fighter bases and flak installations were marked as targets on the map.

Just as the enemy pilot's morale seems to be going downhill, our morale has been, and continues to be, tremendously high. This applies to ground crewmen as well as flying personnel.

When I returned to Washington—while the Sicilian campaign was still in progress—I left one of the finest groups in anybody's air force. Our outfit is highly confident of victory, but not cocky. It's just that nobody ever goes on a mission with the thought, "Maybe I won't come back."

Every man in the group knows the value of teamwork. Every man knows that everyone else depends on him to do his job well. As for the ground crews, they seem to be happier than the pilots when a good job is done in the air. ☆

### Answers to Quiz on Page 39

- (b) Eight.
- (c) China.
- (b) Wind velocity.
- (c) A Jap stronghold on the northern tip of the Kurile Islands.
- A system of aircraft identification which gets its name from the structural units which the student is drilled to take up in order: W—wings; E—engines; F—fuselage; T—tail.
- (a) Liberator. (b) Mustang. (c) Commando. (d) Mitchell.
- (b) C-54.
- (d) Resonance.
- Ordnance.
- (c) Louisiana.
- Absolute ceiling is the maximum height above sea level at which an airplane is able to maintain horizontal flight under standard air conditions; service ceiling is the height above sea level, under standard conditions, at which a plane is unable to climb faster than a specified rate.
- (d) A sudden violent gust of cold land air.
- (b) 4000 miles.
- (b) Thirty degrees.
- (b) A small auxiliary parachute.
- False.
- (c) A Russian pursuit plane.
- (d) Lieutenant General.
- (a) 6080.2.
- Dornier 217E2 Bomber.

### PICTURE CREDITS

5: 10th Air Force. 9: British Ministry of Information. 12: 7th Air Force. 25: Wright Field, Ohio. 27: Harry Conover Cover Girl. 28-29: Acme Newspictures; Signal Corps. 30: Brooks Field, Texas. 33: Bolling Field. 37-38: Drawings by 1st Fighter Command Volunteer. 46: Patterson Field, Ohio. 48: Bolling Co. 55: 12th Air Force. Third and Fourth Covers: AIR FORCE Editorial Office. All other photographs secured through official Army Air Forces sources.



**THIS MAN  
WANTED ALIVE!**



*But* **CARELESS** talk  
can kill him!

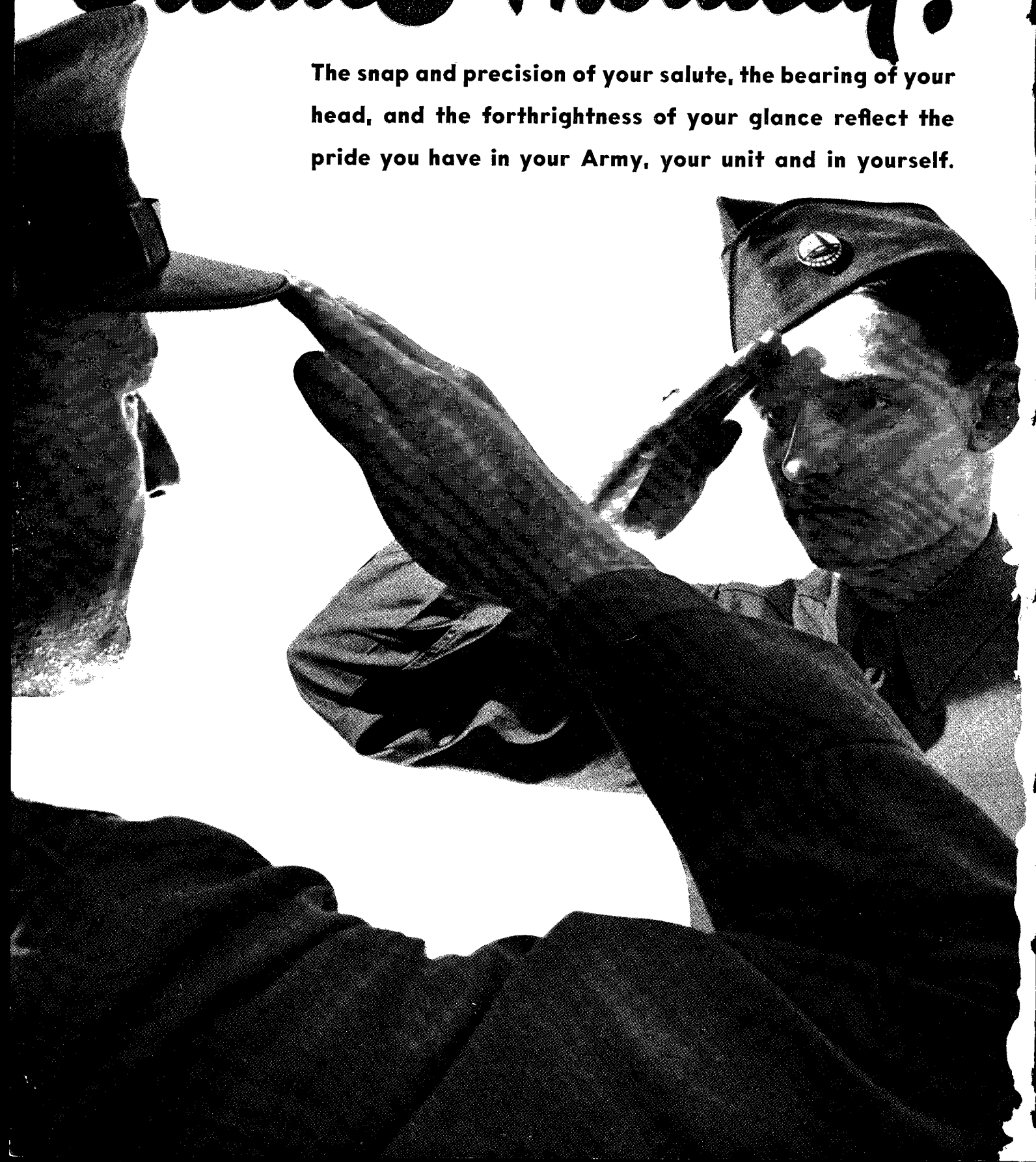
**DON'T DIVULGE FORTHCOMING TROOP MOVEMENTS,  
DESTINATIONS, NUMBER OF TROOPS, TYPES  
OF AIRPLANES OR QUANTITIES OF SUPPLIES.**

**THE ENEMY IS ALL EARS...  
...DON'T BE ALL MOUTH!**



# Salute Proudly!

The snap and precision of your salute, the bearing of your head, and the forthrightness of your glance reflect the pride you have in your Army, your unit and in yourself.



# AIR FORCE

THE OFFICIAL SERVICE JOURNAL

OF THE U. S. ARMY AIR FORCES



NOVEMBER 1943

# AIR FORCE

THE OFFICIAL SERVICE JOURNAL

OF THE U. S. ARMY AIR FORCES



## November Brief

**THE BOMBING ATTACK** which destroyed vital Axis oil refineries at Ploesti, Rumania, on August 1, was one of the most important aerial missions of the war. Back of the attack were weeks of intensive planning and training. A comprehensive report on the attack is presented in a special section of this issue, beginning on Pages 8-9. It contains the story of preparation, General Breerton's pre-attack message to his flight leaders, a first-person "over the target" account of the mission, a summary of the damage inflicted and photographs taken from the bombers during the attack.

**AN ARTICLE** on the importance of air discipline in bombing operations has been written for AIR FORCE by Brig. Gen. Frank H. Armstrong, Jr., former group CO in the 8th Bomber Command in England and now commanding general of a bombardment wing of the 2nd Air Force. General Armstrong participated in more than a dozen raids over the Continent. He was the lead pilot in the first American raid over France, in which only twelve B-17s took part, and he flew the lead plane again in the first American mass attack on Germany. General Armstrong was operations officer on General Eaker's staff when the 8th Air Force was activated, and he later commanded two combat groups. His real experience, General Armstrong says, was "just being with the men. I ate, slept and lived with them. I was a member of their outfit. That was the best of it—just being one of them. There's nothing quite like it." General Armstrong's article appears on Page 5.

**OPPOSING FORCES** inadvertently exchange equipment secrets during wartime. Early in the war, Axis forces learned much vital information about British and American aircraft from wrecked planes forced

down over enemy territory. Enemy planes and equipment have come into our hands in the same manner. The article on Page 38 tells what our engineers learn in their examination of captured enemy equipment and offers many interesting comparisons of this equipment with our own.

**THE FLYING TRAINING** and Technical Training Commands have been consolidated to form the Army Air Forces Training Command, with Maj. Gen. Barton K. Yount, who headed the former flying training organization, as commanding general. The operation of our reorganized training program is described on Page 27. An organization chart of the new Command accompanies the article.

**EVEN BEFORE** the last Japs had been wiped out of the Aleutians, American bombers began softening the northern road to Tokyo with attacks on Paramushiru, important enemy base in the Kurile Islands. An account of the first two raids on Paramushiru has been written for AIR FORCE by Maj. Louis C. Blau, co-pilot of one of the bombers on the first raid and a flight leader on the second, and Maj. Frank T. Gash, also a flight leader on the second mission. Their article appears on Page 18.

**IN ITS MAY** issue AIR FORCE published a second lieutenant's account of his life in OCS at Miami Beach. A copy soon reached a forward base in New Guinea, where at least one reader was more than casually interested in the Miami Beach story. He, it seems, had been a member of the first class to go through OCS in Australia, and his routine had been so at variance that an article by him for AIR FORCE came "quite as natural as a newly dug slit trench after a surprise 'd.' We agreed. Lieut. W. F. Houha's story "OCS—Australia" appears on Page 22.

### The Front Cover

The new P-51 Mustang, high-altitude fighter with the Packard-built Rolls Royce engine, is pictured on this month's front cover. Test pilots at Wright Field are enthusiastic over the combat possibilities of the new 51. They particularly praise its speed at high altitudes and ease of handling. An article describing the development of the P-51 appears in the Technique department on Page 31. Tech. Sgt. Roger Coster, staff photographer, took the cover photo at an east coast port of embarkation.

# CROSS COUNTRY

**I**NCREASING emphasis is being placed on the importance of keeping all air crew members informed concerning targets for strategic bombardment missions, the value of the objectives to the enemy and the results to be gained by their destruction.

In tactical air force missions against military targets, crew members can see the enemy objectives and usually deduce for themselves the destruction hoped for in the attack. But in the strategic bombing of industrial and communications targets, it is more difficult for the average man to understand why a particular target has been selected and what the desired results might be. In fact, other objectives spotted from the air by the uninformed sometimes appear far more inviting than those selected for the mission.

Bombing objectives are selected for good reason, but unless they take on full meaning for every man participating in the attack, the operation can easily become "just another mission." This attitude can be avoided by the thorough briefing of air crews, by airplane commanders discussing missions in detail with members of their crew and informing them on the results of the mission. Ground crews, as well, can benefit from information on the accomplishments of bombing attacks.

These points have been stressed by returning combat crews, especially enlisted personnel, and Headquarters is encouraging appropriate action.

## REPRINT OF THE MONTH

In the March issue we published an organization chart of the Army Air Force and announced that reprints would be available. A flood of requests for the chart resulted. Appearing in this issue (pages 28-29) is the organization chart of the new AAF Training Command, in which the Flying Training and Technical Training Commands have been consolidated. A limited quantity of reprints has been made available for general distribution upon request to the Service Division, AIR FORCE Editorial Office, 101 Park Avenue, New York 17, N. Y.

**AIR FORCE, November, 1943**

## SALESMANSHIP

"**W**HEN we landed that first day in Sicily everybody was friendly as hell," says Sgt. Robert M. Price, a paratrooper from Yakima, Wash. "They gave us everything. They took us down in their cellars and poured out big pitchers of red wine. They always washed the pitchers and took the first drink to show us it wasn't poisoned. That first day it seemed they couldn't do enough for us—and that wine was good!

"But next day it was different. They had cooled off, I guess. They decided there weren't so many of us and maybe we weren't so powerful after all. They surely were different.

"We had fifteen Italian prisoners and even they began to think the Axis would win. That morning we saw two American observation planes in the sky and we all stood there watching them. They were flying very slowly and looked about as defenseless up there as cow sheds.

"Suddenly three Italian planes attacked them. The Italian prisoners jumped up and began to cheer. It didn't look very good for our side. We knew the American planes would be destroyed, and the Italians began making wisecracks.

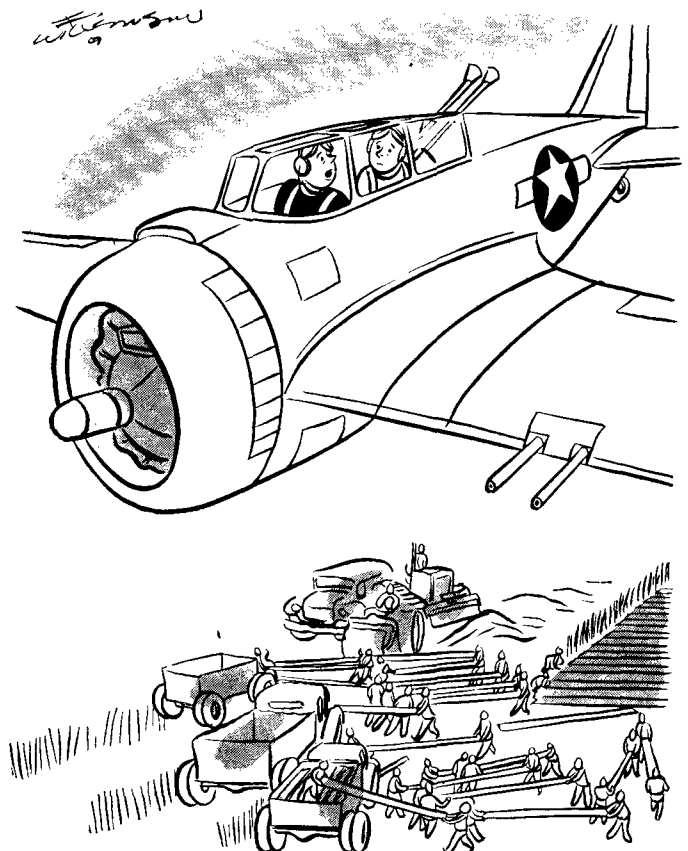
"Just at that moment six P-38s dove out of the sky in a wedge and burst one of the Italian planes into flames. The P-38s climbed up again and came right back in formation.

They tore the second Italian plane all to pieces. Then they got the third one before it could run away. It looked like those P-38s were putting on a show just for our benefit.

"All the while it was going on those Italian prisoners just stood there with their mouths hanging open. After it was over they sat down again. They said the Americans were okay. They didn't give us any trouble after that."

## A DIFFERENT WORLD

That feeling of nearness to a Supreme Being which comes to many men in flight has been described many times, each man expressing it in his own way. This letter



"Our orders are to cruise around a few minutes until they build an airfield." —FRITZ WILKINSON



from a young flyer, to the parents of a pilot missing in action, seems to describe the feeling in a particularly sensitive manner.

"My deepest sympathy is always for the sorrow of those left behind, because often they cannot understand the philosophy of those of us who fly. When a man has spent hundreds of hours in the air, he finds quite a change taking place in himself. Those hours are spent (many of them in solitude) in an entirely different world from those to which he was formerly accustomed. Up there he has plenty of time to think as he views the limitless expanse surrounding him, and breathes the pure air that has not been soiled by our earthly life.

"He cannot keep from realizing his proximity to a Supreme Being and feels His hand guiding and holding the plane aloft. Actually he is sorry for the unfortunate earthbound people who never have experienced the privilege of such solitary communion. So beautiful are some of the sights viewed by a pilot that he can almost feel that he has been permitted a glimpse of what lies beyond.

"It is because of these thoughts and feelings that a pilot has no fear of what is to come. He knows that he is always welcome and has been so close so many times that he nearly knows what to expect."

That letter reminds us of what Wing Commander John Barnes, an RAF night fighter, said of the spiritual feeling which comes to many airmen. The Wing Commander, a song writer in civilian life ("Don't Sit Under the Apple Tree," "Little Lady Make Believe," and others) told how he felt after meeting the Nazis for more than a year in their rage to destroy England.

"You get so you enjoy it," the young Britisher said. "Remember that lovely poem one of your American pilots wrote, about being so high and solitary that you can almost 'touch the face of God.' Well, that's the way it is. You see a glow through a fringe of cloud and you dive out for it. Might be a Jerry's exhaust flame, you know. Then you come through the cloud and there, deep on the night's black velvet, shines a star. That's what it is—a beautiful star!

"It's beautiful when you're up 30,000 feet and look on the incendiaries in Kent, and then across the Channel you see our bombs retaliating, spilling their bloody hell on the French coast. It's the contrasts. You can't ever get used to them. If you follow my own thoughts you can see how these contrasts—the exquisite beauty of the countryside and the crash of death—are more dramatic than the war itself."

#### READ AND REMEMBER

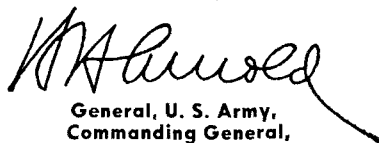
Reports indicate that a surprising number of U. S. airmen shot down in Ger-

## HEADQUARTERS, AAF

### To all Personnel:

Your attention is called to the increasing number of published statements attributed to Air Force personnel, containing expression of opinion on the length of the war, the quality of our efforts and the status of our opposition. Such opinions can serve no good purpose and when they are publicly interpreted to represent official viewpoints, they are both harmful and dangerous. If the present practice continues, the morale of industrial workers, our production of airplanes and estimations of the value of attacks on the enemy will be seriously impaired as each unfounded statement or ill-considered assertion is proved to be erroneous.

The Army Air Forces are making a magnificent combat record but we all must realize that we have a long bitter fight ahead of us. I want you to maintain your enthusiastic confidence in our purpose and methods. But only by greater effort, greater sacrifice and greater devotion to duty can we hasten the day of victory. Until that day arrives, let your work and your authorized spokesmen speak for you.

  
General, U. S. Army,  
Commanding General,  
Army Air Forces.

many have neglected to carry their identification discs. It is reasonable to assume that due to this carelessness some of our dead have been buried without identification.

Without the regulation "dog-tags" our personnel can be held by the enemy as spies and saboteurs on the pretext that they cannot be identified as members of our armed forces. They may also use this pretext to put them in solitary confinement for fairly long periods for softening purposes and to attempt to elicit information from them.

AR 600-40, Change 10, Paragraph 36, is very specific in directing that each member of the Army shall wear his regulation identification tags at all times.

#### SAHIB SNOB

An AAF tech sergeant and his brother, a major with the Army Service Forces in India, had their pictures taken together just before the major left the States. Recently the sergeant received the following letter from his brother:

"My bearer—a Mohammedan boy who is the spice of life and breaks my monotony by efforts to get him to work—saw

the picture of you and me the other day. With a very contemptuous sound he grunted 'sergeant!' Then he pointed to me and said, 'Master very big Sahib!'

After displaying this letter our sergeant slowly folded it and returned it to his pocket.

"I trust my brother hasn't lost too much face," he said.

#### MISSING PARACHUTES

THREE stations have entered candidates this month in our who's who of missing parachutes. Many stray chutes are finding their way home through this monthly feature and all stations are invited to use this medium.

##### Lost:

One 24-inch chest type, Serial 42-766327; return to Commanding Officer, 22nd Transport Transition Training Detachment, DTR, ATC, Municipal Airport, Atlanta, Ga.

Number 42-193842 (Type S-1 AN-24); return to Headquarters, 387th Sub-Depot, Office of the Engineering Officer, Pecos, Texas.

Number 42-445971 (Type S-1); return to 34th Base Headquarters and Air Base Squadron, Squadron Engineering Officer, Grenier Field, Manchester, N. H.

#### LAST FLIGHT

Old 666 took off from a South Pacific airdrome one morning like any able-bodied B-17 and came back a pile of salvage wallowing through the sky. There wasn't much of her that hadn't been shot up and her bandaged crew resembled a rehearsal in first aid.

It was a reconnaissance flight over Bougainville Island and while photographing the Buka runway the crew spotted a string of enemy fighters, about twenty. Half of them taxied out on the strip to take off. But Old 666 headed south along the west side of the island and kept right on taking pictures.

The first fighter moved in, then three more, one sailing in low at ten o'clock. Fire from his guns wounded the bombardier, the pilot and the engineer, destroyed the hydraulic system, damaged the control cables, smashed the pilot's rudders, set the oxygen bottles in the cockpit afire and knocked out all flight instruments but the airspeed indicator.

The bombardier, despite his wounds, kept firing on the enemy fighter until it shattered apart. The navigator, though wounded in the face and unable to see his target, blasted away at another attacker while the pilot, wounded in the legs and arms, continued to fire a fixed gun at still another Zero.

An explosive shell crashed through the nose of Old 666 and knocked the bombardier and navigator back into the catwalk under the cockpit. A burst of small caliber slugs from the same enemy plane

wounded the radio operator and sewed a seam of holes in the fin. The engineer, wounded in both legs, kept his guns firing short bursts as he cleared them of repeated jams.

Despite his wounds and loss of blood, the pilot remained at the controls and managed to dodge some of the enemy and to maneuver the plane so his gunners could get cracks at the others for more than forty minutes. In this time at least five of the enemy were destroyed.

Once Old 666 had dived to low altitude, the navigator ripped out the oxygen bottles and extinguished the flames. When the attack finally ended the co-pilot set the throttles and turned the controls over to the engineer who had told none of the crew of his own wounds. With only air-speed indicator and magnetic compass to guide him, the engineer flew Old 666 for an hour and a half while the co-pilot and the few uninjured members of the crew administered first aid to the others.

The radio operator, severely wounded in the neck, continued to secure bearings and brought the big plane home. On reaching the airdrome the co-pilot took over the controls and found it impossible to lower the flaps. He nevertheless brought her in.

It was her final landing—she was grounded after that—but Old 666 got down and rolled in gently to spare her wounded further pain.

#### CATERPILLARS

That old AAF fraternity known as the Caterpillar Club has been gaining a number of members who don't seem to understand the status of their membership. Letters have been dribbling into the desk of Lieut. Col. Falk Harmel (not a Caterpillar himself but a sort of ex officio historian of the lodge) at AAF Headquarters, requesting information on initiation

fees, membership dues, certificates and the like. The letters have come from personnel who are qualified for membership through virtue of the compulsory use of their parachutes on at least one occasion.

Colonel Harmel asks us to notify all past, present and future Caterpillars that a compulsory—and successful—bail-out is all that is required for membership in the fraternity. There was a time when a commercial chute firm distributed gratis small metal buttons emblematic of membership in the Club, but this token has long been dispensed with. And quite properly, since the metal required to make up buttons for wartime members alone might be sufficient to put the finishing touches on the Axis—or at least a touch. The records show that the Caterpillar Club was founded in 1922 shortly after Lieut. Harold R. Harris made the first free parachute jump when the plane he was testing at McCook Field, Ohio, developed a structural defect. The name Caterpillar was selected because of the kindred spirit existing between the men who emerge with a sigh of relief from the silky folds of their chutes and the little worms that crawl into the light of day from cocoons.

#### MOTOR TRANSPORT

The men who drive the truck convoys and supply the essentials of war have hung up such a great record that we sometimes take them for granted. Two recent citations have come to our attention and we are glad to report them here. The first is a general citation for a Quartermaster Company Service group (Avn), a Quartermaster Company, Truck (Avn), and an Ordnance Company, MM (Avn), all of an Air Service Group in the 9th Air Force, who are commended for outstanding performance of duty during the period September 1 to November 15, 1942.

The citation reads: "During this period, these units by their untiring devotion to duty under the most trying conditions of the heat and sandstorms of the Egyptian desert made possible the active participation of the American Army Air Force units in the Middle East Theatre in the major battle then formulated. The preparation of our air forces in the major engagements during this period and their successes were made possible by the prompt and efficient manner in which these units were able to unload, segregate, transport, store and issue the supplies and equipment necessary for the conduct of operations. Motor transportation equipment was prepared for the use and possession of combat units under field conditions rendering such work virtually impossible. This task was performed night and day during excessive heat, sandstorms and most adverse conditions. These units are to be commended greatly for their exceptionally meritorious contribution to the conduct of operations against the enemy."

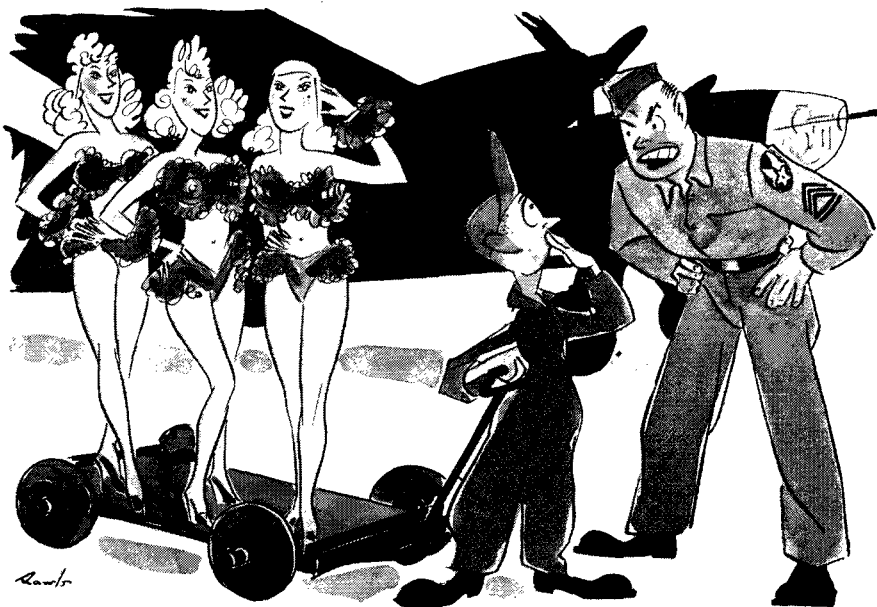
A citation from the commanding general of the North African Strategic Air Force for Capt. A. L. Zachry of Atlanta, Ga., for completion of a difficult and dangerous motor convoy mission in North Africa, had this to say: "In spite of great difficulties presented by strange roads, faulty maps, lack of a guide and the presence of enemy troops in the area, you led this convoy into the airdrome in time to supply our fighters with the gasoline and ammunition needed for the first day of our operation there. The major part of our victory played by the fighting unit operating from this airdrome would have been impossible without the supplies which your efforts delivered, and I wish to commend you highly for completion of a dangerous job in an expedient manner. Your actions reflect credit upon yourself and the military service."

#### HOTEL DE GINK FOR WOMEN

TO ACCOMMODATE WASPs who come through ferrying planes, and visiting WACs on equally serious purpose, a separate hotel for women has been placed across the street from the Officers' Club at Morris Field, Charlotte, N. C. Under the leadership of Mrs. Warner B. Gates, wife of the CO of the field, the women's club was furnished and is being maintained. The small building consists of a lounge and reading room and six bedrooms. Funds to establish this Hotel De Gink for women were raised through parties and war bond auctions. The place has been virtually filled since the day it was opened. The bill is fifty cents a night.

#### FROM THE STAGING AREA

"Winged Victory" is the title of the official Army Air Forces stage show now having its dry runs under the personal direction of the author, Moss Hart. The play will test hop in Boston, November



"Dammit—I said incendiary BOMBS!"

—JAMES T. RAWLS

1. Regular missions start in New York November 18 at the 44th Street Theatre. At the moment all major Hollywood studios are bidding for picture rights. The TO consists of a number of stage, screen and radio personalities in the AAF. Eighty percent of the feminine contingent will consist of wives of Air Corps men. Altogether the show will use over 300 soldiers and five revolving stages. There will be a mock-up of a B-17 on the stage which may or may not fly, depending upon the amount of type of fuel used —by the audience.

### FROM RED TO BLUE

The red border enclosing the insignia for all United States military aircraft has been replaced with a blue border. It seems that the red border, caught at a flash in air action, sometimes resembled the Japanese insignia. Several months ago a new type of insignia was adopted for United States planes. It consisted of the white star in a circular field of blue, with a white rectangle attached horizontally at

the right and left of the circle. Now the blue border encloses the entire device.

### AAF Song Book

If it isn't already in your back pocket, a trip to the nearest PX should get you next to the song book of the Army Air Forces, just published and being made available to PXs in two editions, one pocket size and the other a piano edition.

"Air Corps Airs" is the title and it boasts 78 different songs—words and music—from traditional Air Corps numbers, written by AAF personnel, to popular ones. The pocket edition includes blank pages for the boys who like to write their own lyrics.

The book, only one of its kind, wouldn't look bad in the Christmas stockings of the folks back home. All profits from its sale will go to the Army Air Forces Aid Society.

### SONGS AWAY

THE stories are making the rounds about Capt. John Hunter Pitts, minstrel boy of the South Pacific who chases the Jap with ballad and bomb.

From what we hear, the latent talents of this heavy bomber pilot with the 13th Air Force first came to light on his initial hop over a Jap base. At that time he had never seen Zeros, never been in the searchlights nor experienced anti-aircraft fire. On this trip he got it all. When things were the hottest he made modest acknowledgement to the other planes on the mission.

"This is the radio program — 'I Was There' — starring John Hunter Pitts," he soberly announced.

Another time, while going in for the bomb run, Captain Pitts' tail gunner shouted that a Jap searchlight had found the plane and was holding it in the beam. This, of course, came as no surprise to the captain who knew that ack-ack would soon be moving in on them. He believed, however, that he could com-

plete the bombing run. "Wave at them then take a bow," Captain Pitts instructed the tail gunner. A few seconds later the bombs plastered the target and the big plane pulled away unhurt.

On unescorted harassing missions the captain favors his crew with a program of rousingly appropriate music, usually featuring his loud, baying parody: "Harassing we will go, harassing we will go! Heigh ho, the merrio, harassing we will go!"

After concluding a foray, and having sung himself into a state of appetite, the captain turns his attention to the inner man. Some sixty miles from home base he calls in to the cook.

"This is John Hunter Pitts returning," he says. "Please put the pancakes on."

At last report Captain Pitts, who hails from Phoenix, Ariz., had chalked up 70 combat missions and 403 combat hours. And that represents a lot of singing.

### No Box Tops

THERE will always be a lingering doubt that some radio announcers are not as exercised as they sound over their wares, although John N. Dunham, formerly with Station WBBM sold himself a well-known product. As the commercial announcer for the Air Corps recruiting campaign he lasted through six programs, then enlisted. Cadet Dunham is now in his final training phase at a two-engine pilot school.

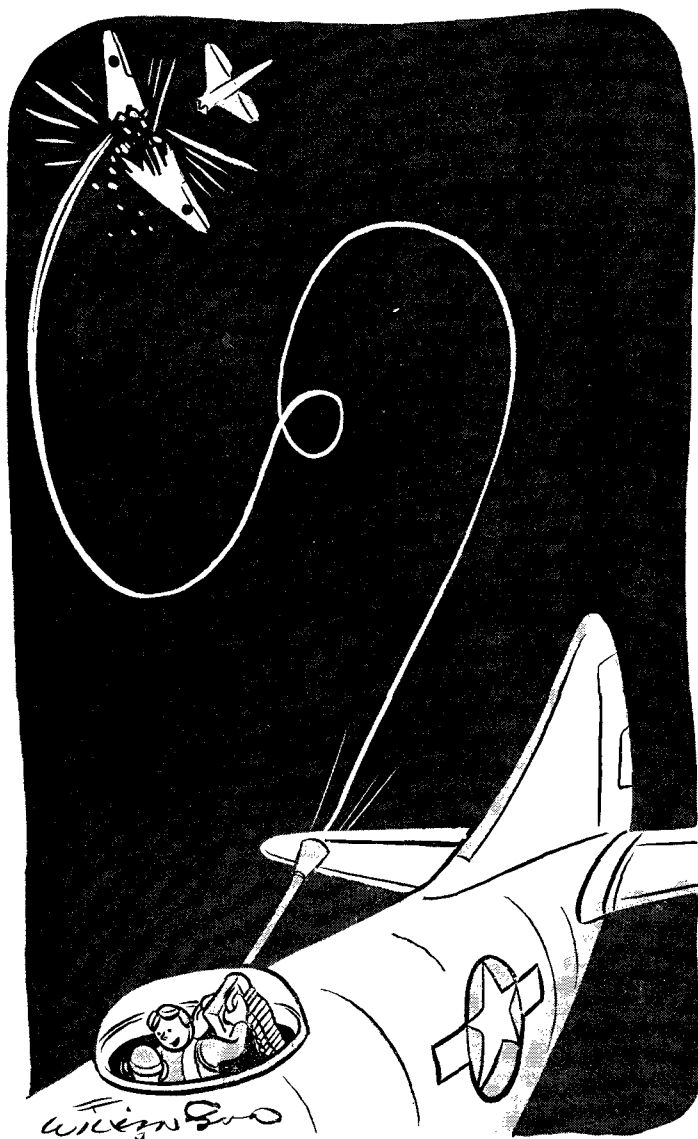
### JOIN THE PARTY

AAF men everywhere are invited to tune in on the annual Army-Notre Dame football rally to be held at the Hotel Commodore, New York City, on November 5, eve of the traditional game. The rally will be carried on a national hookup from 2100 to 2130 (EWT), and the time of broadcast to men overseas will be announced by short-wave two weeks before the event. This program will include special messages from ranking AAF officers and sport and stage celebrities. The Army Air Forces Aid Society will share in receipts of the rally.

### NAVIGATION INSTRUCTOR'S SCHOOL

A NEW central instructor's school where rated aerial navigators will learn the technique of teaching navigation cadets has been established at Mather Field, Calif. This school is the first of its kind to give instructor training to navigators in the United States.

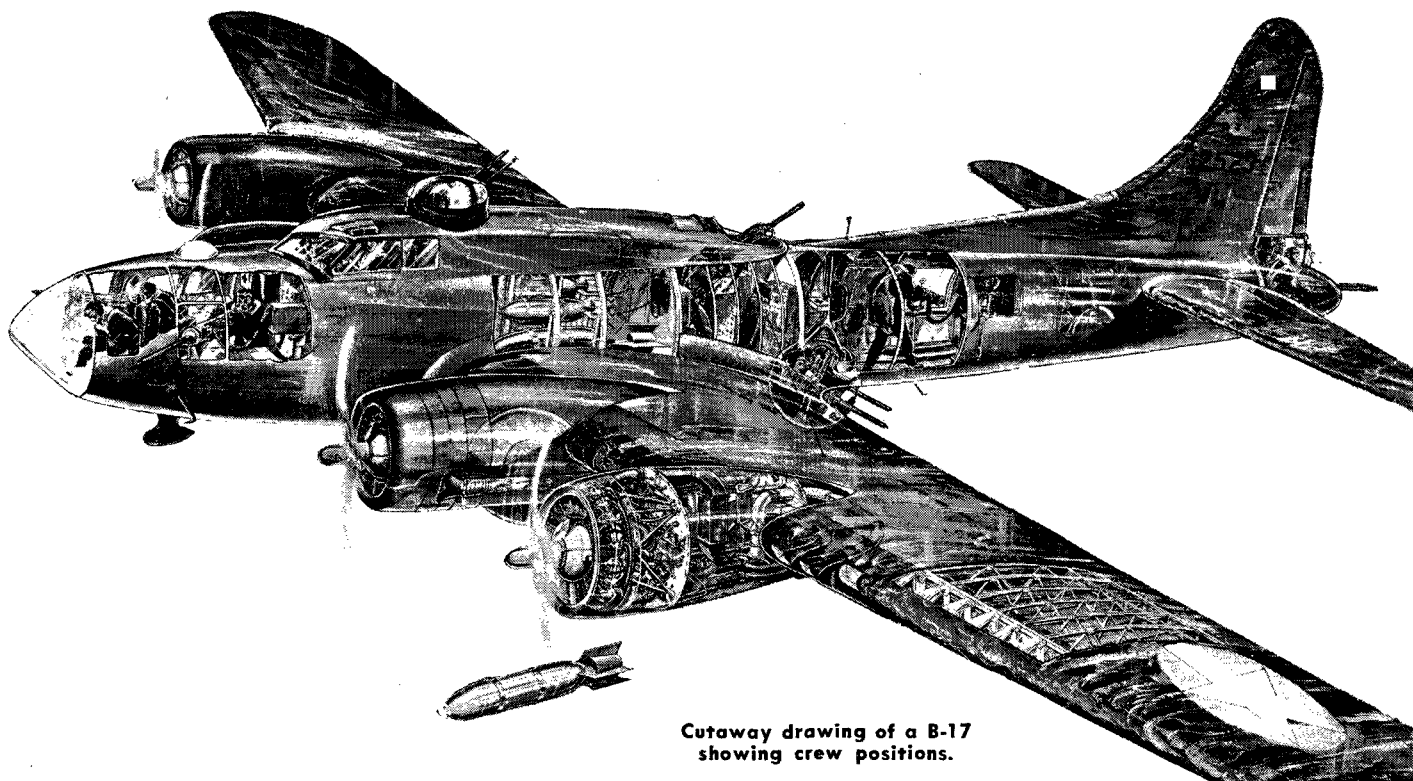
After completing the four-week course, instructors will be assigned to the navigation schools of the AAF Training Command to teach aviation cadets how to take the planes out and bring them back. Navigators who have been overseas will be brought up to date on recent developments, while the navigators as yet untried in combat will receive the benefit of the veterans' experience. —THE EDITOR



"I magnetize the bullets."

—FRITZ WILKINSON

# AIR DISCIPLINE



Cutaway drawing of a B-17 showing crew positions.

*By Brig. Gen. Frank A. Armstrong, Jr.*

FORMER GROUP CO, 8TH BOMBER COMMAND

**T**HERE are no Sunday rides on a bombing mission from England. You work every mile of the way.

It is often hard for new men to understand what lies before them in combat. They come to us like rookies from the minor leagues, wondering and sometimes grouching about the hard work and the discipline. Then they go into action.

Something very definite happens to a man once he has been in combat. The clown of the crew is still the clown, and the men are still full of excitement, but something has changed inside them. The missions seem to take on a new meaning. A deadly seriousness becomes apparent.

The first three missions are the hardest for every aircrew—like a team playing for the championship after weeks of practice games. For the first time the crew is on the spot. The team is confronted by a very real challenge, and has its first chance to prove that its equipment and training are good. The chance also is at hand to see just how good the enemy is.

And no matter how many combat hours a man stacks up, he learns something on every mission, something new and important, since no flights are alike. If he doesn't learn on each mission he had better stop flying and check himself before he stops through no choice of his own.

Of all the many factors involved, nothing is more important than air discipline.

Air discipline is more than a phrase. It is a form of conduct that has as its foundation the complete dependence of one crew member upon another, of plane upon plane, squadron upon squadron,

**In combat you must have something more than good equipment, personal skill and the courage and will to fight.**

group upon group. In its present wide-scale application it is something new in the military, an outgrowth of mass aerial attacks. It is a symbol of both offensive and defensive strength.

Air discipline starts on the ground, with soldiering, and continues in ground school. It takes on new meaning when you first realize the practicality of obeying the rules of combat flying and the consequences of disobeying them. If you

can't discipline a man on the ground you surely can't in the air.

Discipline in the air is the antithesis of the so-called tradition that flying is an independent, somewhat carefree, operation. In combat, the "wild blue yonder" is far less wild when men and planes stick together.

It is sometimes hard for young officers to grasp the meaning of air discipline. They feel they know their jobs, know their equipment, and have confidence in both. But let them knock around in combat with heavy bombers and they'll learn that good equipment and skill are not enough. And I will throw in courage and the will to fight for good measure. Something more is needed. That something we call air discipline.

Perhaps the first thing to be learned is that we are flying bombers and not fighter-bombers, no matter what you may read in the papers. Our aim is to get to the target, drop the maximum number of bombs, and get home again so we can prepare to drop more bombs. We fight through necessity, not through choice. Under no circumstances on a bombing mission do we leave our prescribed course to find enemy planes. There is not a man among us who wouldn't like to take every crack he can at the Hun. But our cracks

come in bombs. Bullets are only a means to an end.

Formation flying is air discipline applied. Its overall objective—maximum striking power with maximum protective power—is always the same. Its method of application is constantly in a state of flux. The enemy tries something new and we counter. When he switches his attack we're all set to change our defense. We can be likened to a catcher and an infield on the alert for a bunt.

WE fly a fairly tight formation, but each bomber is assigned a block of air within which he may maneuver and alter his speed and altitude depending on the situation and the type of attack. It is vital that each pilot understand how much freedom he is allowed and how far he can go without stepping out of formation.

When a plane drops out, it not only jeopardizes its own position but takes twelve guns away from the formation. And when a plane is shot up and starts falling behind we have to let it go. We can't send more planes to stick with it. That would weaken our main effort. It's not easy to continue on your way when you see a ship drop out and know that enemy fighters swarm over a straggler like ants on a fallen sparrow. We do everything we possibly can to save every ship and bring them all back, but air discipline demands that we protect the group.

Knowing that we bomb as a group, the enemy tries to knock down the lead plane. He thinks that is his best bet. But to date the Hun has never turned back a formation. We don't turn back! And we don't jettison bombs—no matter what happens.

The lead bombardier sights for range and deflection and the other planes follow his run. But every bombardier in the formation sets the data in his bombsight. He must be ready to take over in the event something goes wrong with the lead plane or his own ship is knocked out of formation.

During a bombing run, when the success of the whole mission depends on what is accomplished in a two- or three-minute interval, there is no time for formality or for recognition of rank. When the bombardier takes over the ship for the run on the target he is in command. I don't care what the relative rank between pilot and bombardier, the bombardier tells the pilot what he wants done. And he doesn't stand on any of the niceties of military etiquette. The bombardier *tells* him.

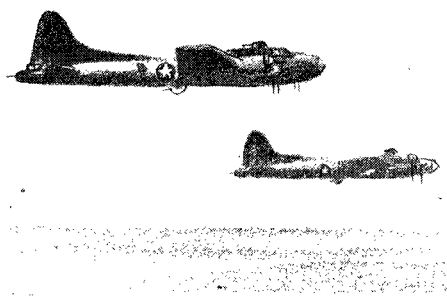
There may be other occasions when the pilot is so guided by another man's judgment, when he virtually relinquishes command of the plane for a brief period. But the pilot is always the captain of the ship. And yet, except when some vital decision is to be made, it is seldom necessary for the captain to exert his authority.

The authority is his and the men know it.

He is the man responsible for nine other lives and for an expensive piece of equipment. Pilots should always be on their way to becoming squadron COs, and I can't think of a more important job. The first prerequisite of a good CO is being so good as a pilot that the rest of the squadron trusts him implicitly.

A pilot can be a good CO and still be congenial, a regular guy. You can command respect from your men and yet live with them and be one of them. You can't be too lenient and you can't be too hard. Above everything, you must have their welfare at heart. When they know how you feel about them they will give you the maximum support.

That understanding between captain and crew is part and parcel of the rela-



tionship between one crew member and another, between a group of specialists pooling their efforts in a single job.

Every man on the plane should know the duties of every other man. I've seen a navigator and top-turret gunner bring a plane in together. The pilot was wounded and couldn't use his arms. The co-pilot was knocked out. So the navigator slipped into the co-pilot's seat and handled the controls; the top-turret gunner worked the throttles; the pilot gave them advice. Between the three of them, they brought the ship in.

Air discipline is essential in gunnery, for in a bomber it is necessary for every man, regardless of his position, to know how to handle the guns.

Gunners are instructed to cover certain fields of fire. This procedure is carefully worked out according to the place of the individual planes in the formation and is designed to bring the maximum number of guns to bear in every position. No matter how certain a gunner is of getting an enemy plane, no matter how badly he wants that plane, he must discipline himself not to swing his gun out of the line of fire he is instructed to cover. It may mean that he has to pass on a sure kill to another gunner, but, more important, it means protection against another enemy ship slipping in at an uncovered angle.

Each man should be proud of his own work and should feel he is an essential

part of every operation. During the early days of our bombing missions over Europe, we showed the pictures of the results of bombing raids only to the pilots and bombardiers. But soon we realized that each member of our air and ground crews was a part of every raid and had a right to see the pictures. We posted photographs in squadron dayrooms. We displayed pictures of aerial combat, too. Now each man can view the results of his work, can profit by his errors and feel a personal satisfaction in a job well done.

Perhaps the best insurance for air discipline among crew members is the fact that a man who is undisciplined is unlikely. Discipline and popularity go hand in hand, in a very practical way. An undisciplined man will fail to carry out his specific duties and will jeopardize the other members of the crew. And the other men know it.

THUS, discipline breeds comradeship, best illustrated, perhaps, in the talking that goes on over the interphone. And there should be plenty of interphone chatter, except when a vital piece of information is to be exchanged or when the plane is over the target. Not only is it good for morale but it serves as a means of keeping crewmen alert, as a check in determining whether crew members are all right, and as a quick method of relaying information on enemy fighter attacks and anti-aircraft fire.

To associate discipline with informality, comradeship, a leveling of rank, and at times a shift in actual command away from the leader, may seem paradoxical. Certainly, it isn't down the military groove, but it is discipline just the same—and the kind of discipline that brings success in the air.

I firmly believe that if you fly and fight intelligently—the way the people in the theatre teach you to fly—and if you observe air discipline, your only serious trouble will come through bad luck. You can be hit crossing the street when you're in the correct zone and the light is with you. It won't be your fault but it can happen. That, to me, comes under the heading of bad luck.

But a lot of so-called bad luck is due to lack of alertness—or a relaxing of air discipline. There can be no letdown over enemy territory, or even near home base on a return from a mission. Occasionally, when returning from long flights, we do what we can to make ourselves comfortable, such as dropping to an altitude where we can stop using oxygen. But in such cases, it is folly to relax. Combat crews must be disciplined to remain alert until they step from their ships on the home field.

Discipline in the air isn't easy. It means a long, hard grind all the way. But it means successful bombing, and no grind is too long and hard for that. ☆



# Poisonality— A STRAGGLER

By **FIRST LIEUT. JAMES J. MAGINNIS**

**8TH AIR FORCE**

*This is the story of a straggler as the pilot tells it—the routine operations report he turned in on the B-17 "Poisonality" which limped back to Britain after a raid on the Fiesler aircraft factories at Kassel, Germany. As many daylight raids over the Continent continue, it is the type of story other pilots tell about stragglers—the bombers which are forced out of formation to return home on their own or go down fighting.—THE EDITOR.*

We took off on a flight to Germany, flying in the second element of the high squadron of the high group in a three group combat wing. We formed and ascended without trouble and saw a few fighters and a little flak as we crossed the coast going in.

Things went well until forty minutes from the target when the manifold pressure on No. 4 engine suddenly dropped to twelve and stayed there. We manipulated turbo control, throttle, mixture, rpm and cowl flaps, but could get no rise from the turbo. It was quite evident that either the turbo regulator or the turbo itself was gone. The engine was left running since it wasn't holding us back too much, and a feathered engine is always an invitation to enemy fighters. We determined to reach the target so long as they didn't cause us to lose the formation.

At this time Sergeant McCurdy, the left waist gunner, reported that the flaps had crept down four to five inches. This was indicated in the cockpit but the flaps would not retract electrically. The waist gunner was ordered to crank them up and bind the handle in place. This was done, though the flaps remained slightly down.

We stayed with the formation on three engines until about ten minutes before the target when No. 4 engine began to throw oil and smoke very badly. At this point, we feathered it.

The target was reached OK and our bombs were dropped from close formation. With the help of Second Lieut. William J. Holloway, the navigator, the turns from the target and rally point were anticipated and utilized to keep us in close to the formation.

Right after the target we began totaling the gas and found the greatest amount was 95 gallons in No. 4 tank. It

was evident we would have entirely too little gas to complete the mission as scheduled. Tech. Sgt. William A. Glenn, the top turret gunner, was ordered to transfer fuel from No. 4 to No. 1 tank since No. 1 was the lowest. He set the fuel transfer valves and pump but after fifteen minutes it was evident that no gas was leaving No. 4 tank. The pump fuse was checked and found OK. No hand transfer pump was installed.

It was necessary to use full power all the way out to stay with the formation in its evasive action against flak. When possible we climbed up into the high squadron on the inside of turns, and when necessary we dropped down into the lead or low squadron on the outside of turns.

Then as we approached the coast, No. 1 began cutting out for lack of gas causing us to drop behind the formation. We dove to try and catch the low squadron, and at this time I first heard the plane being peppered with bullets and shells. We could not catch the low squadron so I dove for the group below us.

An explosive shell hit the oxygen, throwing splinters into pilot and co-pilot, filling the cockpit with smoke and dust a starting a fire. Although not wounded, Lieutenant Holloway and Second Lieut. Edward C. Piech, the bombardier, were knocked down and stunned. The co-pilot put the fire out with a fire extinguisher. Simultaneously, the bomb bay doors swung open, the flaps went down one-third, and No. 1 engine stopped putting out and was feathered.

I started diving at 250-300 mph and over 6,000 feet per minute, taking evasive action, while heading for a layer of strato cumulus clouds at 5,000. Near the cloud layer, with No. 1 and No. 4 engines feathered, orders were given to prepare for ditching. In the cloud layer a course of 275 degrees was taken and soon No. 3 engine ran out of gas and was feathered. Altitude was lost to 3,000 feet, where we broke out below the cloud. The fighters had left us.

No. 4 engine was unfeathered and was found to put out full power but no turbo boost. Airspeed was kept at 110-120 to maintain 3,000 feet altitude. All prepara-

tions had been made for ditching. SOS's and QDM's were going out OK. Sergeant McCurdy, badly wounded, was in the radio room being treated.

We sighted the English coast about ten miles ahead. As we crossed the coast at 3,000 feet, No. 2 engine began to falter, and soon thereafter was feathered. That left No. 4 doing all the work.

A few miles inland we spotted an airport under construction. We examined the control cables and surfaces and found them satisfactory for any landing. The wheels were put down, and we stayed between the coast and airport so a ditching or beach landing could be made if wheels fully or partially failed to extend.

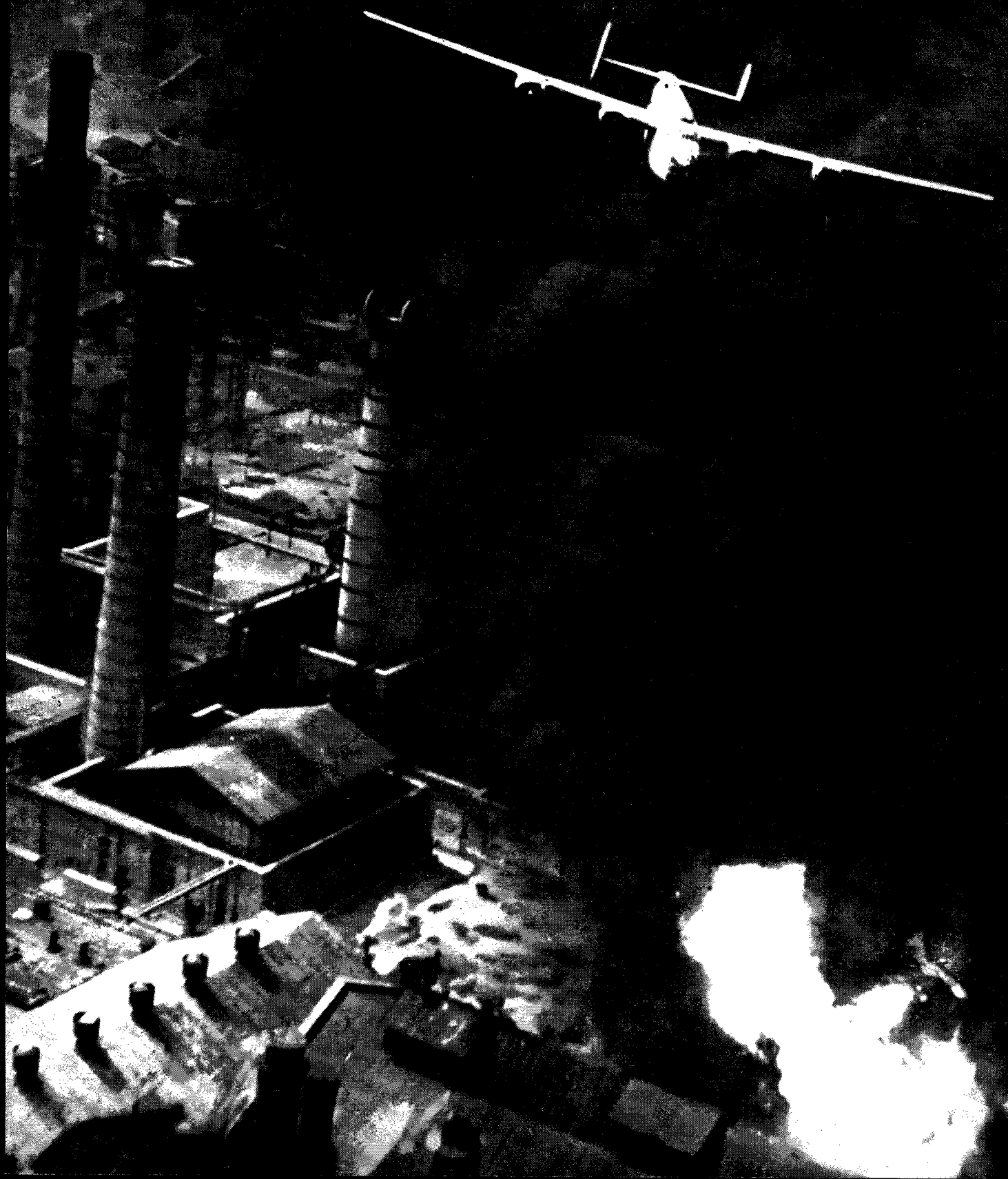
Two of the three runways had large obstructions on them but the third had only minor obstructions such as barrels and bales of wire. The wheels and tires were down and checked, so an approach was made with the crew in position for crash landing. The landing was made and immediately the right tire began to get flat. The ship was kept on the runway with left brake and No. 4 engine, the only unfeathered engine. About thirty gallons of gas were left in No. 4.

Perfect cooperation was achieved by the whole crew. Every man did his assigned job throughout and all obeyed orders quickly and accurately.

In the few minutes of running fight Sergeant Reeder, the tail gunner, shot down two enemy fighters; Sergeant Long, the ball turret gunner, shot down another, and Sergeant McCurdy a fourth after he had received his mortal wound. ☆

*Lieutenant Maginnis' report is fairly complete, but it does not reveal that "Poisonality" was so badly shot up by enemy fighters that it could not be repaired. It does not say that everything movable in the B-17 was jettisoned and that besides the fatally-wounded left waist gunner four other members of the crew, including Lieutenant Maginnis, were struck by 20 mm shell fragments. The others were Second Lieut. Roy H. Peterson, co-pilot; Sgt. Daniel J. Reeder, tail gunner, and Sgt. Angelo J. Riccardi, right waist gunner. Other crew members not previously mentioned by name were Tech. Sgt. William A. Harvey, radio operator, and Staff Sgt. Verl P. Long, ball turret gunner.—THE EDITOR.*

# ATTACK



# N PLOESTI

At a base in North Africa several months ago, Maj. Gen. Lewis Brereton, commanding general of the 9th U. S. Air Force, called together his group commanders, leaders and deputy leaders. It was more than just an ordinary meeting. The talk he gave them might well be called one of the most significant of the war. General Brereton said, in part:

"As most of you know, the 9th U. S. Air Force has been charged with the destruction of the Rumanian oil refineries . . .

"This task will be accomplished by one zero altitude attack with every B-24 that can fly to Ploesti and return . . .

"German armies on the Russian front and the German and Italian armies fighting our own troops in Italy are almost entirely dependent upon Rumanian oil . . .

"The sudden, complete and permanent denial of Rumanian oil will inevitably result in the collapse of German hope for a successful offensive against Russia and a successful defense against our invasion of Italy . . .

"The complete destruction of Rumanian oil refineries this month, with follow-

up attacks against other related objectives, might well bring an end to the European war six months to a year earlier than can otherwise be anticipated . . .

"Time is of the essence. We must do this job now that Germany has committed her troops to an offensive in Russia and a vigorous defensive in Italy . . .

"The piecemeal destruction of the Rumanian refineries will not have the desired effect. Destruction must be complete and final. Our force, led by you men, must sweep clean the Rumanian oil industry.

"You have been assigned a task that could not be accomplished by a dozen ground divisions in a period of months. You men must do the job virtually in one day . . .

"No more important task has been ever assigned one striking force."

*On these and following pages AIR FORCE presents information on various factors of the Ploesti mission, illustrated by photographs taken during the attack from the low-flying bombers.*  
—THE EDITOR.

## PLANNING THE MISSION

By Col. J. E. SMART

HEADQUARTERS, ARMY AIR FORCES

THE Ploesti attack, carried out by 177 B-24s on August 1, differed from other operations in many particulars. Most significant, perhaps, is the fact that heavy bombardment aircraft were employed to make zero-altitude precision attacks upon well-defended objectives. But it is also significant that the operation was conceived and planned in detail in Headquarters, Army Air Forces, rather than in the field, as is normally the case. Its subsequent development had the assistance of agencies of the 8th Air Force, the 9th Air Force and the RAF.

Thus, while the commanding general, 9th Air Force, alone was responsible for its conduct, the mission had the fullest possible degree of preparation from both intelligence and training aspects.

A history of the operation begins many months ago.

Allied industrial experts knew well the vital points and bottlenecks of Axis fuel production and refining. The Ploesti area

**High-lighted by flames and silhouetted against the dense smoke, a B-24 (left) flies low over the burning Astra Romana Orien refinery during the Ploesti attack.**

of Rumania loomed large in their calculations. There—around the cities of Ploesti itself, around Campina, twenty miles to the northwest, and Brazil, five miles south—were located that nation's major oil refineries. This area refined all Rumanian crude oil—approximately a third of the total used by the Axis. It also accounted for all the Rumanian cracking capacity.

General Arnold's staff drew up a plan envisaging the destruction of these refineries by a low-level attack involving B-24 type aircraft based in North Africa.

The plan was then presented to the Combined Chiefs of Staff. After obtaining the views and recommendations of the commanding general, Allied Forces, Mediterranean Theatre of Operations, they directed that the proposed operation be carried out at such time as to interfere least with the invasion of Sicily and permit adequate training and preparation. It was further directed that two B-24 groups based in the United Kingdom and one in the United States be sent to the Mediterranean theatre for participation in the raid.

Conduct of the operations was assigned

to the commanding general of the 9th Air Force.

While the original plan designated a low-level attack, the planning and operational members of General Brereton's staff made a further study. They examined the possibilities of both high and low-level attack. They estimated the relative degrees of success that might be expected, the probable and possible losses, and the predictable advantages of both.

General Brereton, after considering this data, decided that the initial attack would be made at low level with all available aircraft.

Following this decision, there were assembled in the 9th Air Force specialists in intelligence, low-level operations, weather, communications, navigation, material, armor and armament peculiar to the B-24, draftsmen, artists, architects and other personnel.

THE Commanding General, Army Air Forces, prepared the broad, basic plan; collected and prepared intelligence data, especially that obtained from petroleum technicians with first-hand knowledge of Ploesti targets; studied the availability of forces and consequent loss to other undertakings by diversion of personnel; arranged for the manufacture, procurement and shipment of low-altitude bombing sights with mount for B-24 aircraft; ordered the procurement and shipment of special delay action fuzes; transferred certain specialist personnel, and handled the procurement and transfer of sufficient aircraft and combat crews to bring each of five groups up to their required strength.

To the overseas commands went responsibility for execution of specific training and supplemental intelligence functions.

Much credit for success of the raid must go to the 8th Air Force and the RAF.

It was the commanding general, 8th Air Force, who conducted tests to demonstrate the practicability of the low-level attack en masse.

The flying technique finally decided upon for the mission was largely shaped by the results of those tests.

Further, the commanding general, 8th Air Force, trained in low-level bombing all combat crew personnel of one bombardment wing, prepared target folders, aids to navigation and other material.

The Chief of Air Staff, RAF, made available all intelligence and operational personnel and facilities of the Air Ministry, constructed scale models of the Ploesti targets and vicinity, helped in the making of motion pictures for the briefing of crews, and provided mechanical aids to navigation for some of our aircraft.

The RAF in the Middle East assigned operational and intelligence specialists, assisted in the briefing and indoctrination of crews, and furnished data on the enemy's use of smoke screens and other



**Bombers head home, leaving the blazing refineries behind.**

factors affecting success of the mission.

Among the functions of the 9th Bomber Command were the adaption of detailed plans for bomb loading; the drawing up of routes to and from the target, the approach, attack, withdrawal, timing and related tasks; the construction of dummy scale targets and the conduct of simulated coordinated attacks against them; the supervision of all training; the instruction of crews, and the distribution of target and briefing data.

**T**HESE vast preparations, quickly described, took months for actual accomplishment. Even when the B-24 groups were completely equipped and assembled in North Africa, there were arduous days of training, days in which crews learned to fly their heavy ships just a few feet off the ground for miles and miles, to acquire navigational skill to find and bomb life-size dummy targets with a rare degree of coordination and accuracy.

Clearly, the B-24 was not designed for extremely low work. The crews, however, practiced bombing the dummy installations until no more than sixty seconds elapsed from the time the first bomb dropped by the first plane hit the target until the last one from the last plane struck.

August 1 was chosen as D-Day and the attack was carried out in accordance with Field Order No. 58 of the 9th Bomber Command.

One hundred and seventy-seven B-24s departed from their base. They flew a route designed from the standpoint of both direction and height to avoid all known enemy detecting devices. The height varied, of course. At times the ships were at an altitude of 10,000 feet. But the approach to the Ploesti area and the actual bombings were made at tree-top levels which can only be appreciated by examination of photos taken on the mission.

It should be emphasized here that the intelligence data furnished at Head-

quarters and other commands proved highly accurate. Furthermore, where photographs were not available, artists had drawn pictures of the target and of points along the route which pilots and navigators found extremely helpful.

Despite this, some trouble was encountered. Col. Jack Wood, for example, led one group of B-24s against Campina. This group of refineries lay in a valley with a slope toward the southeast. The plan was for his planes to come in for a downhill run from northwest to southeast. He was supposed to fly low up one valley, hop a ridge, turn down another valley and hit the target.

Upon arrival at the base of the mountains, he found the tops of the mountains

covered with clouds, which made it difficult to find recognition points. He picked a likely looking valley, made his run and went over the ridge. He found it was the wrong ridge.

Wood then turned, flew his planes back up another valley and made a second run. This time they found the target and completely wiped it out.

Other planes from other groups had similar difficulties. Our losses on the raid were quite high. Nonetheless, of the 177 aircraft departing their base, an impressive number reached the target, attacked it with devastating force and wrought a destruction so enormous that it must seriously impair the working of the Axis military machine.

## '... Conspicuous Gallantry'

The Medal of Honor has been awarded to two colonels who led separate elements in the August 1 attack on Ploesti, marking the first time this nation's highest award has gone to two participants in the same military mission. The recipients of the Medal are Col. Leon W. Johnson of Moline, Kan., and Col. John R. Kane of Shreveport, La., who were cited for almost parallel acts of valor.

While proceeding to their targets on this 2,400-mile raid both elements led by Colonels Johnson and Kane became separated from leading units in the low-level attack when they encountered dangerous cumulus cloud formations over mountainous territory. Though temporarily lost, both colonels later brought their elements into contact and continued to the targets, completing their attacks without the advantage of surprise upon which the success and safety of the mission largely depended. Both officers carried out their attacks in the face of thoroughly alerted defenses, destructive anti-aircraft fire, enemy fighter planes and the imminent danger of exploding delayed-action bombs dropped by the previous element, oil fires and explosions and intense smoke which obscured the targets.

"By his gallant courage, brilliant leadership and superior flying skill," the citation read, "Colonel Johnson so led his formation as to totally destroy the important refining plants and installations which were the object of his mission. Colonel Johnson's personal contribution to the success of this historic raid and the conspicuous gallantry in action and intrepidity at the risk of his life above and beyond the call of duty demonstrated by him on this occasion constitute such deeds of valor and distinguished service as have during our nation's history formed the finest traditions of our armed forces."

Colonel Kane's citation read: "By his gallant courage, brilliant leadership and superior flying skill he and the formation under his command successfully attacked this vast refinery so essential to our enemies' war effort."

"Through his conspicuous gallantry in this most hazardous action against the enemy and by his intrepidity at the risk of his life above and beyond the call of duty Colonel Kane personally contributed vitally to the success of this daring mission and thereby rendered most distinguished service in the furtherance of the defeat of our enemies."



# OVER THE TARGET

By Capt. JOHN S. YOUNG

9TH AIR FORCE

**Y**OU might say that the Ploesti oil refineries in Rumania were destroyed on the African desert, long before the real raid.

The actual attack on August 1 was only the continuation of a rehearsal which began six weeks earlier at our advanced bases in North Africa. A routine announcement was made that 177 B-24s would fly 2,400 miles for a low altitude precision attack. Our target: Ploesti's cracking, distillation and power plants.

We had already helped chase Rommel across Africa. Ours had been the first outfit to bomb Italy. We had hit Greece and Crete and we had hunted convoys all over the Mediterranean. But this raid was going to be different.

On previous missions, we had bombed whatever we could find. We had gone out with general instructions to find Rommel and give him hell. When we hit the European mainland, we had made a lot of saturation raids. But for the Ploesti mission, every plane in every element was given a pinpoint—and we had to find it. There were no secondary targets. Col. John R. (Killer) Kane, our group CO, was not being dramatic when he said, "Either we hit Ploesti or we'll die trying."

We examined hundreds of still photographs. We saw motion pictures taken from the air before the war, showing us exactly what the area would look like from our bombers. We attended lectures given by a former manager of one of the Ploesti plants. And we had a detailed relief map of the surrounding territory, complete with roads and even trees. Finally, a miniature model of the targets, drawn and constructed to an exact scale, was laid out on the desert and we practice bombed it for weeks.

We ran approximately twelve missions over that replica of the oil fields, approaching, attacking and departing exactly as we intended doing on the actual

raid. Each element was given a specific dummy target which had been erected to resemble the real thing, and we practiced until we could bomb it in our sleep. When we finally did get over the real Ploesti, our movements were almost automatic. In a low altitude raid, you have to know precisely where you are going because you don't see your target until you are on top of it. And we knew we could only make one pass.

**O**UR Liberators were modified considerably for the mission. An extra releasable fuel tank was added in the bomb bay. The top turret guns in the lead planes were arranged so that they would fire forward, so the first ships could strafe the entire area, with the following planes protecting their rear. Extra fifties were mounted in the noses of the lead planes.

Five bomb groups made the raid. Colonel Kane and I were piloting the lead ship of the first element. The second group was on our right wing, a third on the left, another further to the left, and the fifth on the extreme left. We flew a flat V, wing tip to wing tip—no plane in the entire formation was more than 25 feet away from another plane.

We had forty-eight planes in our element, flying in sections of five. The first four sections had ten planes each, with an eight-plane section bringing up the rear. Each of the first twenty ships carried 1,000-pound bombs with sixty-minute delayed action fuzes. The sixty-minute fuzes were a precaution against premature explosions damaging the last planes over the target. In practice bombings, we got the entire flight across the target within a minute and fifteen seconds, but we were prepared for the possibility that some ships might get lost on the way and reach the target late. Each plane in the last three elements carried 500-pounders with 45-second delayed action fuzes.

Weather conditions were perfect when we took off at 0710. We crossed the Mediterranean at 2,000 feet. At our initial point we ran into thick cumulus clouds at 10,000 feet and lowering. Over Yugoslavia, the clouds started settling in and we had only about 1,000 feet of visibility over the 9,500-foot mountains. As we came into the Danube Valley, we dropped down to 2,500 feet and followed the Danube River to our target.

All the way across the Mediterranean and over part of occupied Europe, we

**With storage tanks ablaze in background, bombers pass over cracking unit furnaces (A) and fractionating columns (B).**





# ATTACK ON PLOESTI



Smoke pots fired by the enemy obscured some of the targets.

didn't even see an enemy plane. It was like a practice mission but, naturally, we maintained radio silence. In that long ride, I don't think anybody said a word.

About 35 minutes from our target, we lowered to twenty feet off the ground. And I mean twenty feet. We were coming in so low our plane actually had to pull up to avoid hitting a man on a horse. That horse probably is still running.

The fun started when we spotted a freight train sited at a railroad junction. There must have been fifty cars full of oil just inviting our personal attention. Tech. Sgt. Fred Leard, our right waist gunner, and Sergeant Weckessler, top turret gunner, were mighty eager boys. They called Colonel Kane on the interphone and asked if they could "test" their guns. They had gone through a routine test just after we left the field and everything was in proper working order. But they wanted to make sure, and if a German oil train was sitting beneath them—well, that was just coincidental. The Colonel, never a man to object to a "routine" check, gave his approval and the "test" began.

All the other gunners decided that their guns needed a check, too—just to make sure they were working. It probably marked the first time in history that a routine gun inspection resulted in a Nazi train being blown right off its tracks.

About two miles from the target, the flak guns bellowed out a reception comparable to none I had seen in 330 combat

hours against some heavily defended targets. Most of it was 20 mm stuff, with some 40 mm and a lot of machine guns. The fire was plenty accurate.

A mile and a half from the refineries, we opened up with our fifties aiming at the oil tanks which held about 55,000 gallons of oil. They started to explode, throwing smoke and flames about 500 feet into the air. There we were, buzzing in at twenty feet, doing 200 miles per hour, flying through intensive flak and bouncing around between oil fires. Play that on your harmonica sometime.

Our particular targets were the Orion and Astra Romana refineries. They had smoke stacks about 210 feet high, so we had to climb to about 250 feet to drop our bombs. Flames were biting in through the bomb bay doors, the heavy smoke fires made visibility difficult, and the flak fire was beating a hellish tattoo all over our ship, but with all the practice under our belt we had no difficulty picking out our targets. We laid our bombs down the middle.

Forty of the 48 planes in our element got over the target. One cracked up on the take-off and seven others turned back with mechanical troubles. The rest of us didn't miss.

After the bombs were away, we dropped back to twenty feet and about fifty ME-109s and 110s jumped on us from the right. We were flying so low they

couldn't dive on us, but they did lazy eights all over our formation and caused us plenty of trouble.

The housing around the propeller and three cylinders of our No. 4 engine were shot out. Two feet of the prop on the No. 1 engine was smashed, tearing a foot and a half hole in the left aileron. The motor was vibrating like a bucking bronco. And we had a wing cell leak in No. 3. We (I say "we" because Colonel Kane and I were both flying that airplane) put on ten degrees of flaps—no more. Ten degrees gives you the best lift without creating too much drag. We kept our wings straight by using the rudder, not the ailerons. Use of ailerons under those conditions is liable to drag a wing down.

We were still at twenty feet—maybe less. As a matter of fact, Lieut. R. B. Hubbard, our radio operator, called Colonel Kane and suggested that we get some altitude because we were collecting a mess of branches, leaves and cornstalks. The colonel investigated and I'll be damned if Hubbard didn't hand him a cornstalk!

The fighters kept coming in and we accounted for three. They attacked for about twenty minutes, and we just put the ship on the ground and ran like hell.

We muddled through the fighter attack, and staggered away from the target on two and a half engines. About 200 miles south of the refineries, we realized that we couldn't return over the Mediterranean with our battered ship. We decided to hug a land route going back. The chief topic of conversation was picking a good place to set her down. Everybody was pestering our navigator, Lieut. Norman Whalen. For my money he's the best in the business. He finally had to tell the colonel, "Look, if you guys will just leave me alone for awhile, maybe I'll find a field." We left him alone. Whalen was navigating for two other damaged planes which were following, and the three of us were being covered by Lieut. Royden LeBrecht. Nothing had happened to his ship.

We crossed an enemy airfield at 1,500 feet and the flak batteries opened up. I don't know who was more surprised. But we got away without trouble.

In order to gain altitude to cross a mountain range, we threw out everything that was movable. We released the extra gasoline tank and tossed out oxygen bottles, gas masks, ammunition, radio equipment and anything that a screwdriver could dismantle. I haven't yet seen the humor in LeBrecht's remark, but he called and inquired: "What the hell are you doing, redecorating?"

We finally got up to 6,600 feet, but we needed 7,000 feet to cross the mountains. By picking our way through canyons and ravines, and with some lucky updrafts, we managed to get over.



A portion of the flaming Colombia refinery, showing the boiler house (A) and power house (B).

The plane was hobbling along now at 130 miles per hour and we knew that it might stall around 125 mph. It was still flying, however, and we kept plugging along. We had a choice of putting her down on land or flying across open water to the nearest Allied landing field. The colonel and I realized that there was a good chance the ship would flop into the water, but we had come too far to worry about that. As we crossed the coast, Whelan gave us an ETA of 2110 for the selected airfield.

Whelan was on the nose to within a minute. Exactly fourteen hours and forty minutes after we left Africa, we let her down.

We had to crash land the plane, but nobody was hurt and the first thing I did after we got away from the ship was to kiss the navigator. Yes, I really kissed him.

A couple of days later we got back to our original base where Major Selvey had a dove and pheasant dinner waiting for us. Major Selvey is group materiel officer, and I suppose he figured that the banquet came under his department.

After the experience, I think I am in position to offer some advice to men who may go on a similar raid. The most important thing for you to do is learn formation flying to perfection. Even with a heavy bomber, you must be able to stay no more than 25 feet away from your

wing man. You've probably been told before about flying tight formations. In combat, you do it or you don't come back.

Don't be afraid to hug the earth. A B-24 will fly ten feet off the ground and you'll find real safety down there. Practice evasive tactics until they come out of your ears. When the enemy peashooters attack, keep in a turn, increasing and decreasing that turn, and stay on the ground. Whatever you do, don't fly in a straight line. When a fighter climbs after his first pass, he has to look for you all over again. If you are flying straight, he'll be able to pick you out very easily.

All aerial engineers should practice the EXACT procedure for transferring gasoline. That can't be over-stressed. I think we lost a couple of planes on our raid due to the difficulty in making the proper transfer. Get rid of the gas in your bomb bay tanks as quickly as possible and transfer it to the wing tanks to avoid having a chance hit in the bomb bay blow you up.

When we returned I was asked the extent of damage we did to the Ploesti refineries. Naturally, that's hard to figure, but I can speak first hand of our particular targets, the Orion and Astra Romana refineries. The boys in our element agree that no German oil will come from them for quite some time. ☆

## 'Mission Accomplished'

The Ploesti mission proved once again that American bombers can carry out precision attacks on remote and seemingly invulnerable targets with the accuracy of a skilled surgeon guiding his knife.

Each bomb dropped had a particular address. The exact targets were selected meticulously, after months of planning, for their relative importance. The number of planes assigned to each individual target was gauged in proportion to its size and importance.

The refineries at which our airmen struck were in three groups—at Ploesti, at Campina and at Brazil. There are about forty refineries in the Ploesti area, of which two-thirds are obsolete and unimportant and were discarded as targets. Our main forces were concentrated on the large refineries and other installations in Ploesti, while other planes were dispersed to the plants on the outskirts.

Our planes singled out their objectives one by one and pulverized them with the precision of rifle fire.

The largest of the Ploesti refineries was the Astra Romana, important because of its large production of gasoline, one-third of all Rumania's production cracking processes. It is also the central receiving station for oil from most of the other refineries. It pumps all oil moved to the Giurgiu terminal of the pipeline on the Danube, over which it is moved to Germany.

We damaged its powerhouse sufficiently to put it out of operation, demolished its cracking installation and destroyed almost half its operational capacity.

The Steaua Romana refinery at Campina is a very modern plant with the most modern distillation equipment. It was wiped out.

We wiped out most of the vital parts of the Creditul Minier, which had large modern cracking equipment and an important aviation gasoline plant. It was erected only last year.

The Colombia refinery had a considerable proportion of cracking equipment. We destroyed most of its vital parts and cut its operational capacity in half.

Half of the Phoenix Orion plant was obliterated.

These are but some of the plants we hit. Damage was wrought elsewhere. The bombs dropped included many of the delayed action type and it is certain that their detonations caused further havoc.

The effect of this mission on the German war effort cannot be immediately apparent. It must show in the vast curtailment of an essential source of the European Axis' oil supply, and in the enormous burden placed on the Axis transportation system. The latter involves the necessity of hauling crude oil from the Rumanian fields to refining plants far distant from the fields, and rehauling the refined product in many instances all the way back to Germany's Eastern front, to which the surviving refineries are not nearly so handy.

The effect must show in a strain throughout the entire German war machine through depletion of a vital resource, and in an ill-afforded burden of an extra handling operation imposed on the already overloaded rail transportation system.

# PREPARE FOR



## TIMELY ADVICE FROM THE AIR INSPECTOR

*Matters presented here are informative only, and are not to be considered as directives.*

**WELL DRESSED FIGHTING MEN:** What the well dressed soldier will wear overseas depends on you inspectors at showdown inspections after warning orders are issued in this country. Here are some points to keep in mind when checking clothing and equipment:

**Trousers:** Fair wear will usually show up at the bottom and back of legs, edge of pockets, fly or scat. Hold the trousers up to the light to check wear.

**Coats:** Be sure to look at the cuffs, edges of pockets and buttonholes.



**Field Jackets:** Inspect cuffs and collars at folds. Hold the cuffs and collars in both hands and apply pressure to determine serviceability.

**Shirts:** Check for frayed collars, and worn buttonholes, cuffs and elbows.

**Shoes:** Look over soles and heels, back stay, counter and insole. Close scrutiny will often reveal that the slip sole is torn away from the welt or that the back stay is split on the insole.

**Leggings:** Check for broken eyelets and worn straps, and stitching pulled out along seams.

**Raincoats and Overshoes:** Inspect for holes, cracks, cuts and the like. Look particularly for snaps that have pulled loose from the rubber or fabric.

**Mess Gear:** Be sure that the hook on the meat can cover is intact.

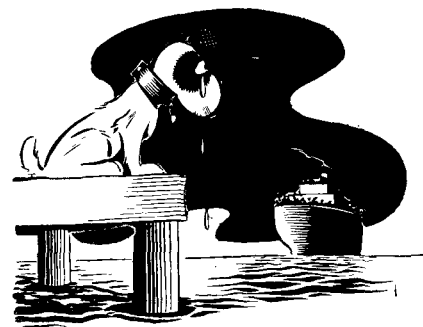
**Field Equipment:** Check buckles, snaps, straps and stitching.

**TRAINING AIDS:** Two publications which should bear the imprints of frequent thumbing by S-3s in the field are FM 21-6 and FM 21-7. The first is entitled "List of Publications for Training," and the second, "List of Training Films, Film Strips, and Film Bulletins."

The United States Army has the world's finest training aids, and it is up to S-3s to know what they are and to put them in service. To help S-3s with this work, The Air Inspector recommends a chart showing what manuals have been issued to organizations and activities, and how many additional ones are needed.

**UNUSED EQUIPMENT:** Inspectors, when you see crates of idle equipment stored in a warehouse, start asking questions. What is it? What is it used for? If you can't get the answers, open the crates. The equipment may be something that should be utilized on your base—or at another station. Purposes for which bases were designed sometimes change, and equipment for one type of organization no longer serviced may be merely gathering dust.

**LIVE WIRE SIGNAL MEN:** Add to reasons why Americans are defeating the Axis: The signal company of a service group starting its training at a western base had not yet received its switchboard. The company wanted to set up telephone service for the group *now*, so its commanding officer talked to the Base Signal Officer. Parts of a switchboard—many of them old and badly worn—began to materialize from base supplies and from cast-off equipment of the local telephone company. After repairing the worn parts, the signal men put the various pieces together and soon had in operation an exchange that provided both service and training facilities. The best training, however, came from putting the switchboard together. The organization is now overseas with a new switchboard, and you can bet it will take a direct bomb hit to put it out of commission permanently.



**GOOD-BYE, PETS:** Overseas movement orders mean a parting of the ways for an organization and its mascot—duck, dog, cub bear or what have you. Don't show up at the port of embarkation with a spaniel wagging its tail among the luggage. Port officials have enough to do without disposing of assorted animals and fowl, not to mention pet goldfish.

**PROTECTING MONEY OVERSEAS:** Going overseas, soldier? Here is some information you will want on postal money orders when purchasing them for the protection of your personal funds:

Just have the postal money order drawn payable to a relative or to yourself at the United States post office at your home address or that of the relative. You can then hold the order for a year and still get it repaid to yourself as remitter at your APO or any other APO branch of the same United States post office. At any time, however, you can send the money order to the relative to whom it was originally made payable. If the order is issued showing you as payee also but is drawn on the post office at your home address in the United States, you can indorse it over to anyone you wish residing at the office on which the order is drawn. It can be cashed there for a period of one year from the last day of the month in which issued (WD Circ. 155, 1943).

**GETTING TO THE BOTTOM OF SHOE PROBLEMS:** Your feet are the ones that will hurt, soldier, not those of the inspector, if you arrive overseas with a pair of shoes having bad soles. Don't try to "get by" the inspector.

Some of you men lining up for show-

down inspections wear brightly polished shoes that are not serviceable and should be replaced. The shoes may on occasion be passed over by the inspecting officer, but fortunately for him he will not have to wear them. Although they feel comfortable on your feet now, they may worry you more than the enemy in rough country overseas.

AR 615-40 states that company or unit commanders will require squad leaders to make weekly inspections of shoes. But that doesn't mean that each man shouldn't check his own shoes daily.

Aids to keeping shoes in shape:

Frequent polishing.

Regular application of properly prepared lubricants (dubbin).

Avoidance of drying by direct contact with heat.

So far as practicable permitting natural drying.

No single pair of shoes should be worn on consecutive days. Alternate with a second pair.

**SLEEVE PATCHES AID INSPECTORS:** Inspectors, you now have a new aid in checking on malassignment of enlisted

## ★ INSPECTING THE INSPECTOR

Are you checking to see that all references to "limited service" are deleted from service records of men retained on active service? (WD Cir. 161, 1943.)

☆☆☆

Do you know whether service records are accompanying all enlisted men transferred from your organization or station?

Is everything possible being done to speed up the submission of shortage lists in preparation for overseas movement?

☆☆☆

Do you give credit where it is due?

☆☆☆

Are you checking to see that long distance calls are being held to the minimum?

technical specialists. We are talking, of course, about the distinctive sleeve patches of men in job classifications of armament, communications, engineering, photography and weather, which are authorized by AAF Regulation 35-12.

Each man receives six patches to be worn on the outside sleeve of the coat, field jacket and shirt (when worn without the coat), and on the left breast pocket of the fatigue uniform. By noticing the sleeve patches of men at work on a base, the inspector can often tell at a glance whether they are properly assigned.

Overseas, these patches are particularly

valuable as men can be picked quickly for jobs when rush calls are received.

**BOMBER TEAMWORK:** "If it weren't for the tail gunner using the interphone to keep me posted on the formation behind, the top gunner reporting to me what he can see, the ball turret gunner telling me what he can see, it would be almost impossible for me to fly the airplane in combat. I can't get up and look around. Those fellows are my eyes."

In these words, Capt Robert K. Morgan, a pilot with a record of 25 successful bombing missions, pointed out the importance of teamwork for a bomber

## AID FOR ALERTED UNITS

In keeping with his policy of passing on to other commands valuable practices observed in the course of inspections, The Air Inspector presents here an outline of the assistance program for alerted units organized by the base administrative inspector at Bradley Field, Conn.

To assist the base commander in carrying out his responsibilities to an alerted tactical unit, the base administrative inspector's office brings to the unit commanding officer advice and personnel aid whenever necessary.

Immediately upon learning that a unit has been alerted, an inspection is conducted to determine the status of the organization as regards training, supply, personnel, morale, etc. This might be called a preliminary POM inspection. Action is started to bring into play all the members of the base staff who can assist in preparing the unit for overseas movement. Such showdown inspections called for by warning or movement orders are made with the aid of the base S-4 and Quartermaster. Other base officers are expected to take the initiative in providing aid, with the work coordinated by the base administrative inspector to assure that all details outlined in POM are covered.

Accuracy of the records of the individual soldier is stressed, since any future benefits which may be due himself or his beneficiaries depend largely on those records. A special questionnaire covering some thirty points on personnel matters aids in checking and correcting

service records and allied papers.

Dissemination of clothing and equipment lists makes the conduct of a complete showdown and preparation of shortage lists a much simpler and more accurate task. Displaying of marking posters in barracks speeds the accurate marking of individual clothing and equipment.

Of special aid to inspecting officers are loose-leaf binders (6 by 9 inches) containing extracts of pertinent regulations



and directives, maintained up-to-date and indexed for ready reference.

The base administrative inspector considers it a personal obligation to lift the morale of the enlisted man to the highest degree. The organization's furlough list is reviewed with the unit commanding officer, and men with overdue furloughs, especially those stationed a considerable distance from their homes, are encouraged to obtain the privilege of a trip home prior to overseas movement

Where time is short and distance is long, with monetary conditions permitting, the base administrative inspector recommends that the transportation office issue priorities for commercial airline travel.

In the final stages of an alerted unit's preparations, prior to the troop movement, the administrative inspector's office assists the organization by following through with the transportation department on the dispatching of household goods and boxing, crating and marking of equipment. The actual handling of the troop movement—consultation with the Traffic Control Division, Washington, D. C., set up of kitchen cars, etc.—is supervised by the administrative inspector's office to assure 100 per cent base cooperation.

Considered vitally important are the following general points:

Don't be cold and aloof when inspecting a unit. Close cooperation is needed from all concerned, and a highly critical attitude will not attain this result.

Maintain a genuine interest in the unit's welfare.

Be liberal with advice, but be sure it is based on information that is accurate and up-to-date.

Stimulate interest by individual contact, wherever possible, with the enlisted man actually making entries in records.

Don't be stingy with your time and energy, and each alerted unit which leaves your field will be confident and cheerful with the knowledge that everything humanly possible was done to bring the unit to a high state of efficiency.

## ★ HERE ARE THE ANSWERS

**Q. Can rebuilt shoes be taken overseas?**

**A.** If the inspector at the showdown inspection decides the shoes are serviceable, they will go overseas. However, if they are found to be unserviceable, only Class A shoes will be issued as replacements (Par. 12c, AR 615-40).

☆☆☆

**Q. Does the requirement that the Individual Pay Record (Form 28) re-**



**flect up-to-date accurate pay data at all times mean that entries must be made for each monthly payment?**

**A.** No. The reference to "up-to-date" pay data means that all entries on Page 2 and 3 of the form will be accurate and complete. Only "casual payments" made to enlisted men while absent from their organizations need be entered in the form. Casual payments include partial payments or payments for a month or months made to enlisted men where separated from their organizations. It is no longer required that entry be made of the last payment to enlisted men preceding their transfer to another command (Letter, Headquarters, AAF, 1 July 1943).

☆☆☆

**Q. Does the reference in POM to the removal or obliteration of insignia before departure for a concentration area, a staging area or a port refer to the AAF shoulder patch?**

**A.** No. The shoulder patch remains. The directive refers to unit organizational insignia, not to Army Air Forces insignia.

**Q. Can an Army exchange call up on the post engineer to render services?**

**A.** Yes. When materials, supplies or equipment have been furnished, the exchange will pay promptly by check to the post engineer for the actual cost thereof, including cost of services (AGO WD Memo W210-17-43).

☆☆☆

**Q. What happens to athletic and recreational equipment purchased from WEMA funds when an organization is ordered overseas?**

**A.** It is turned in to the nearest post, camp or station prior to departure for a port of embarkation staging area (Memo S210-9-43, ASF, Office of The Adjutant General, 17 May 1943).

☆☆☆

**Q. If there is a conflict between POM and the overseas movement order, which governs?**

**A.** The movement order. POM is considered a part of the movement order.

crew. Tactical inspectors cannot emphasize this point too much. Working together on the interphone is only one phase of the necessary teamwork of a crew. Inspectors should check to be sure that crew members are becoming familiar with all jobs on a bomber.

**DIVIDENDS IN BOMBER RAIDS:** Technical inspectors, have you ever stopped to think when you read that 50 American bombers attacked a target in the Ruhr Valley or the Solomons that only 45 might have made that raid if you had not been doing your job? Or that 55 bombers might have participated in the raid if you had done a better job?

First and second echelon maintenance on planes and engines often pays dividends months later in combat.

This is just to remind you that too much stress cannot be placed on maintenance inspections—preflight, daily, 25- and 50-hour, etc.

**104TH ARTICLE OF WAR:** If you are stumped on some question regarding punishment under the 104th Article of War, look up AAF Memo 35-6, 17 July 1943. This memorandum discusses in detail the "do's and don't's" of punishment.

**PACK THEM TOGETHER:** "Keep the parts of sets together in packing cases."

You will be glad you heeded this advice when you get overseas and start to assemble such items as an M1937 range. If the repair kit, the pans and the stove are in different cases, you may have a hot meal and you may not. Packing cases sometimes become widely separated on the trip between the States and battle zones.

**PASS THE AMMUNITION:** In making ordnance inspections, here are some points to be checked:

Are oldest lots of ammunition being issued first?

Are sufficient copies of AR 775-10 available in the organization and are they being used?

Are excess stocks of ammunition on hand, and if so, what has been done to eliminate them? They should be reported

to the next higher headquarters for disposition.

Is every effort being made to salvage used cartridge cases, links and packing boxes? The salvaged items should be turned into the base ordnance officer for disposition. They should not be allowed to accumulate in the armament shop. ☆

## Camera Acrobatics

Although gremlins are too quick to be caught by the camera, this shutter was fast enough to show what they might do to a turning prop. Believe it or not, this is a Hamilton Standard three-blade hydromatic propeller with aluminum alloy blades of conventional type.

The explanation is not a cyclonic gale that bent the blades like tree limbs. The effect is simply the result of a trick camera shot at Wright Field.

The picture of the propeller, which was turning counter-clockwise, was taken with a focal-plane shutter which exposed the image on the film from the bottom of the picture toward the top.

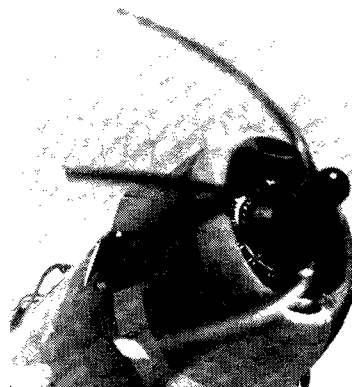
During the time the shutter slit or opening travelled completely across the picture, the propeller had turned through a considerable portion, probably one third, of a complete turn (120 degrees). In moving from the bottom to the top of the picture, the shutter opening first exposed the image of the tip of the lower blade in the lower left hand corner. As the shutter opening moved towards the

center of the picture it continued exposing successive portions of the lower blade in positions more and more counter-clockwise.

When the shutter opening was in a position to expose the center of the picture it happened that the middle blade (in the picture) was horizontal and parallel to the slot. Hence the middle blade was exposed almost simultaneously throughout its entire length and did not move far during its brief exposure. It therefore appears practically straight.

The exposure of the image of the top blade started at the hub when the blade was to the right of center. As the shutter opening moved upward, the top blade moved counter-clockwise so that

by the time the opening got to the top of the picture the image of the tip of the blade had moved into the upper lefthand corner of the picture. Intermediate portions of the blade were photographed in correspondingly intermediate radial and circular positions outward and counter-clockwise. ☆





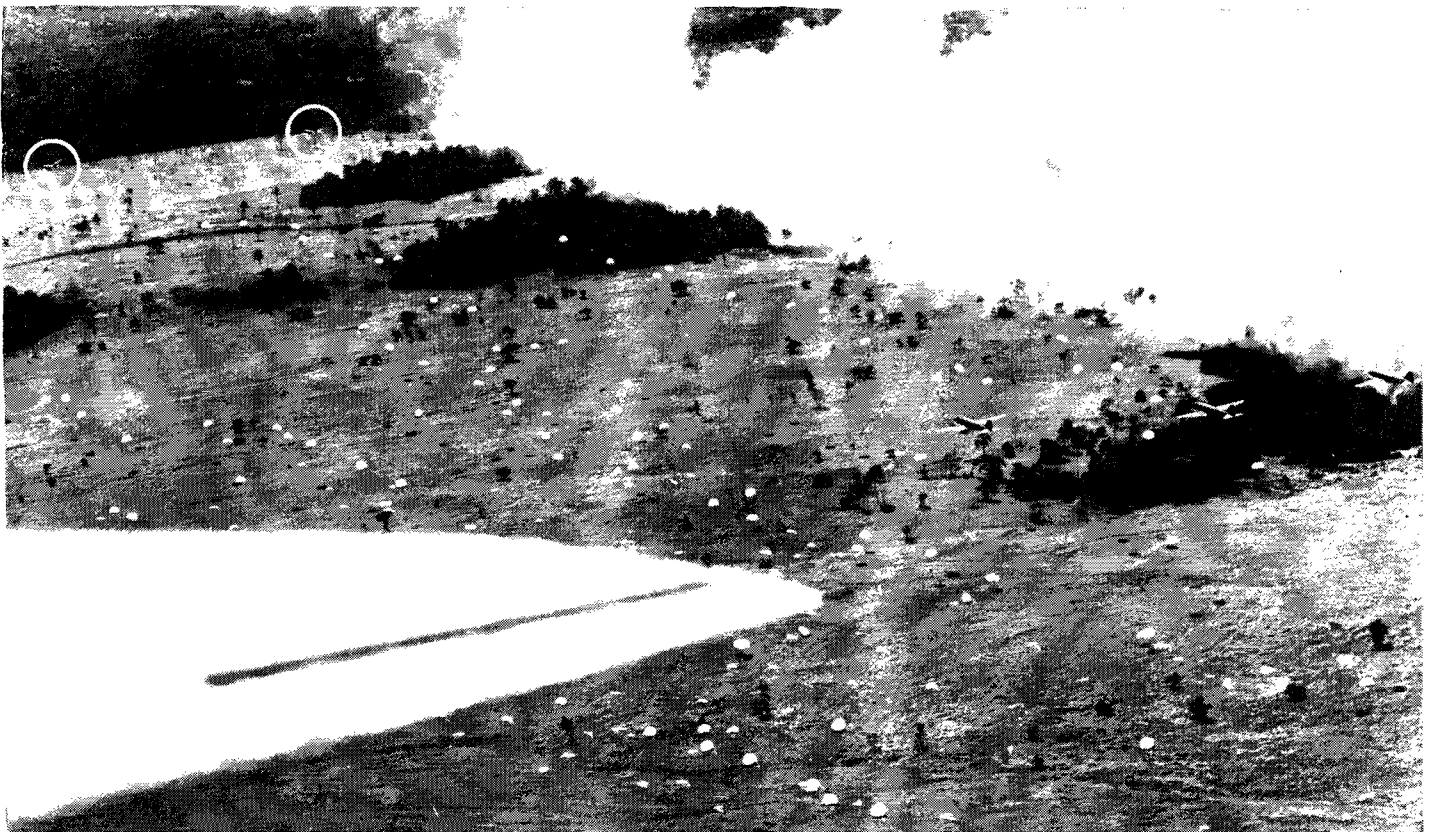
# DESTRUCTION BY PARACHUTE IN NEW GUINEA

**A**s the battle in central New Guinea neared a climax, parachutes were playing their part in the Allied offensive. For the first time in the Southwest Pacific theatre, American paratroopers were dropped behind enemy lines to block the retreating Jap forces in the vicinity of Lae. Jumps were made successfully from a lower altitude than had ever before been attempted in such a combat maneuver. At the same time, other parachutes were falling on enemy airdromes—these supporting fragmentation bombs which blasted enemy aircraft on the ground and wrought havoc with base installations. Using this and other methods of low-level attack, American bombers were pounding Jap airfields with such regularity that the enemy defenders on the ground were almost completely without air support. In one attack on four airdromes in the Wewak area, more than 225 Jap planes were caught on the ground, many of them wing-to-wing; 120 were destroyed and a number of others severely damaged.

These chutes carry paratroopers and supplies dropped behind enemy lines near Lae. The smokescreen in the background conceals the operation from the Japs. Note the two AAF transports > upper left, which have unloaded their passengers in a string behind them.



Dangling from these chutes are fragmentation bombs, aimed at Jap planes caught on the ground at an airfield in the Wewak area. Bombers come in at tree-top level in raids of this type.



# BOMBS FOR PARAMUSHIRU

By Majors LOUIS C. BLAU and FRANK T. GASH

11TH AIR FORCE

**How our Aleutian-based bombers drew first blood against the Jap stronghold on the northern approach to Tokyo.**

*MAJOR BLAU was a co-pilot on the first mission against Paramushiru and led a flight on the second. Major Gash was a flight leader on the second mission.—THE EDITOR.*

**W**HAT impressed everybody most about Paramushiru was the size of the targets.

Month after month we had bombed a thin rim of pinpoint targets around the curve of Kiska Harbor, but the army staging area on Paramushiru and the naval base on Shimushu Islands were duck soup. If your stick overshot a warehouse, it plunked right down in the middle of a barracks area. You could hardly miss hitting something.

When we first learned we were to take a crack at Paramushiru we were still so busy bombing Kiska that there was little time to make any special preparations. It was to be just another mission. The plan was to bomb Kiska on the way over, take on some more bombs at Attu, and after bombing Paramushiru, drop another load on Kiska on the way back. In that way we wouldn't waste any time or gasoline.

Our information about the island that was supposed to be a Japanese Gibraltar, guarding the northern approach to Tokyo, was meager. As a result, our first mission was for reconnaissance as much as anything else.

Still, there was an extra thrill in that take-off from Attu on July 19. The distance on the course plotted for the trip

and return was only about 1,700 miles, not far as missions in the Aleutian area go. Whatever qualms we had over the lack of emergency landing spots between Attu and Paramushiru were compensated for by the thought that we were carrying the offensive to the enemy. It was our first crack at the Jap in his native haunts.

Our Liberators, loaded with 500-pound bombs, were in command of Maj. Robert E. Speer. The weather on the way over was mostly hazy, although occasionally it cleared to CAVU. We kept to about 3,000 feet and then climbed to about 12,000 as we approached the Kamchatka Peninsula. The peninsula is mountainous, somewhat like the Aleutians, but quite wooded. We rubbed our eyes at seeing a tree, some of us for the first time in a year. After following the coastline for awhile, we cut off for our run to the target.

**T**HIS first visit apparently was a complete surprise for the Japs. There was not a plane in the sky; none were even seen until after our bombing runs had been completed. Apparently not even the anti-aircraft was on the alert, because only four or five bursts were seen. Either they didn't have any more anti-aircraft set up or the crews were out for coffee.

As we approached, the clouds became broken and when we got over the target area visibility was good except for a low-lying haze which obscured the effect of

the explosions. However, many excellent photographs were obtained and some smoke could be seen by the rear gunners.

One flight of three ships made a run at 18,000 feet attacking buildings in the vicinity of the airdrome near Kataoka. Another flight, through a misunderstanding of signals, dropped none of its bombs on the first run but had plenty of time to get away its entire load on a second run at about 17,000 feet, concentrating on shipping in the strait.

Many fishing and naval vessels and eight or nine large transports were observed in the strait. Several bombs were seen to drop close to these vessels, one of them scoring a near miss on a transport.

It was all over in less time than it takes to describe it. As we headed back home, five single-engine pursuit planes climbed up to intercept and two of about twenty float planes observed on Lake Bettobu, east of the naval base on Shimushu, got

ILLUSTRATED BY

CAPT. RAYMOND CREEKMORE



*Capt. Raymond Creechman*

off the water but their heart apparently wasn't in it. They gave up the chase within two or three minutes. The mission returned to Attu without a single bullet hole or so much as a scratch from anti-aircraft fire.

Our reception on the next trip, three weeks later, was quite different, to put it mildly. We bombed Kiska on our way over to the jumping off spot in the afternoon and everybody spent most of the night checking guns, motors, bomb racks and the thousand and one things that have to be looked after on any mission. We had a hunch the Japs might be waiting for us a second time.

With the aid of photographs obtained on the first mission we had a much better idea of our objectives when we took off through the early morning mist on August 11. In "A" flight were planes piloted by Major Gash, Lieut. Jerome J. Jones and Lieut. James R. Pottenger.

Their target was the Kataoka naval base on Shimushu Island.

Making up "B" flight were planes piloted by Major Blau, Lieut. Robert Kammerer and Lieut. Robert Lockwood. Their target was the army staging area along the west coast of Kashawabara Bay. The planes of "C" flight were piloted by Capt. Irvin L. Wadlington, Capt. Harrell R. Hoffman and Lieut. Leon A. Smith. Their objective was shipping in Paramushiru Strait.

We cut down on the gas so each plane could carry a heavier bomb load. "A" and "B" flights also carried incendiary clusters.

Weather was CAVU most of the way over to the Kamchatka coast. We flew from 10,000 to 12,000, climbing to 18,500 as we turned south.

When we reached the tip of Kamchatka we found that both Paramushiru and Shimushu were overcast with a top of

about 2,000 to 2,500 feet so we circled down to make a dead-reckoning run. After checking all stations over the interphone and finding everybody ready to go, all three elements headed for the target. Then we got a break.

The run is less than ten minutes. As we approached, the overcast became broken and we could see that over the targets the sky was clear enough to make a bombsight run as originally planned.

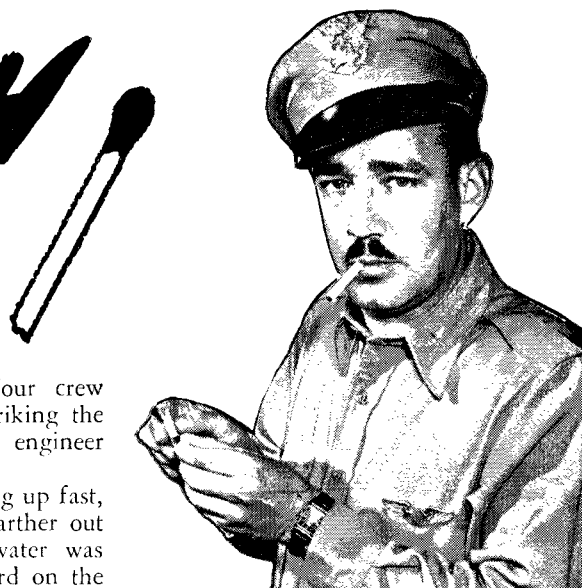
Then the No. 2 supercharger of Lieutenant Lockwood's plane went haywire and the No. 4 engine cut off altogether. He managed to feather the prop on his No. 4 engine but started to lag behind the other two ships of his flight. After coming all that distance, however, he didn't want to turn back without dropping his load, so he advised his flight leader he would keep course and make the best speed possible.

The second visit (Continued on Page 55)

# LAST MATCH

By First Lieut. DAVID W. SMALLWOOD

AS TOLD TO CAPT. ALLEN C. RANKIN, JR.  
HEADQUARTERS, AAFETC, MAXWELL FIELD



A MAN doesn't think much of his undershirt until it saves his life.

Mine under my flight jacket was cotton, the same kind I had bought for years back in my home town of Oxford, Miss. Besides, this undershirt was worn out and I gave it less than no thought at all as our B-18A lifted from the runway and dropped Anchorage, Alaska.

So long, Anchorage! We grinned from ear to ear—Lieut. Oscar Cook in the pilot's seat, myself beside him as co-pilot and the crew huddling exuberantly together in the rear. So we were going to escape, were we, if but momentarily, from Alaska's green firs, its white ice and deep blue water—and its silence? We thought we were.

I had put the memory of a year in the Aleutians and the vivid mental picture of two bomber crashes behind me. Now, I thought about nothing but getting home.

All day our two ships, being ferried back in exchange for new ones, held their formation. Like two geese, we roared along over waste and water and ice in a dead straight line for home.

More of the same the next day. It was bright noon and we still roared along, Maj. Kenneth Northermar piloting the head ship and we sticking dead on his tail. Suddenly our ship lurched.

Major Northermar's voice snapped into our radio: "Your wing's on fire." The rest happened quickly. Fire wrapped the wing—and the wing was full of gas—then the right motor conked out.

"We're gonna have to go," said Cook, wrestling with the controls. Through drawn lips he said, "I'll tell you when to tell 'em to go."

I ran back in the ship's belly and checked the chutes. The men were standing at the open door, ready.

Cook fought to get the ship over land before he let them go. He was trying to make an island off Prince of Wales.

"Now," he said. I gave them the high sign and we no longer had a crew. Cook and I scrambled out the top hatch and jumped together.

As my chute jerked open I saw my friend whiz down in front of me. I watched him until he disappeared behind a mountain. I don't know whether he was hit by the ship or not, or if he ever pulled his ripcord, but the chute didn't

open. Later, I found that four crew members had met death on striking the icewater; that only the ship's engineer and I had survived.

That blue icewater was coming up fast, and the wind was taking me farther out from land. To land in the water was death. I dumped my chute hard on the land side and fell as far as I dared. Then I let the chute fill again, and hoped.

I hadn't hit in the water. My face was smashed and my back sprained. I was dangling by my chute from the top of two tall fir trees. Just dangling. It was a long way down. I knew if I kept swinging up there I'd freeze so I unbuckled my straps and let go.

Snow broke the fall and I bogged down waist deep in it. I knew I should do something but it hurt too much to move. I finally crawled under a tree and stayed there. Two hours must have passed before I got my bearings.

I knew I would freeze if I didn't get up and exercise, and keep exercising. There was a sheet of ice on my flight jacket. I groped for my emergency kit, then remembered my fingers had been too cold to get it off the chute in the tree.

The watch on my wrist said 12:20. It had stopped when I hit.

I struggled toward the beach.

Then I knew why I couldn't see. I was being blasted by a snow storm. I had to find shelter. My head was clearing.

I stumbled upon a dead tree which had fallen across a ravine, making a dry burrow. I crawled in and tried to build a fire.

Boy Scout tricks failed. The letters I took from my pocket for kindling wouldn't catch in the damp leaves. Desperately, I struck match after match.

When only one match was left, I pocketed it for possible future use and went on exercising, waiting.

I was on the beach. I didn't know how long I'd been there. It seemed ages. It must have been almost midnight when the storm abated. All I could think of was the pain in my back. But I kept moving around as much as I could. I had to. I don't know why, but I had one little tune in my mind and it stuck. I went on whistling it into the icy wind. "Ninety-Nine Miles from Home . . . Ninety-Nine Miles from Home."

I sat down to rest.

Terrified, I realized I had dozed off just for a moment. The "twack" of a drove of ducks hitting the water nearby had awakened me. I stood up, knowing I must not sit down again. I went on exercising.

I could hear a boat whistle. The thought that somewhere down the beach the boat might be looking for me gave me hope.

Suddenly the cutter came around the point, with lights on its decks and a big searchlight swinging in toward shore and combing the mountains behind me. I screamed at it until I no longer had a voice, but I could tell the boat was slipping past, leaving me.

Then I got the idea. As the boat turned to clear the point, I ripped down my outside clothing and snatched off my undershirt. I bent over that crumpled bit of cotton, my stiff fingers holding the last match. I struck it and the tiny flame flickered.

Then it caught the cotton and flared like a bonfire as I waved the shirt. You never saw a prettier blaze than that!

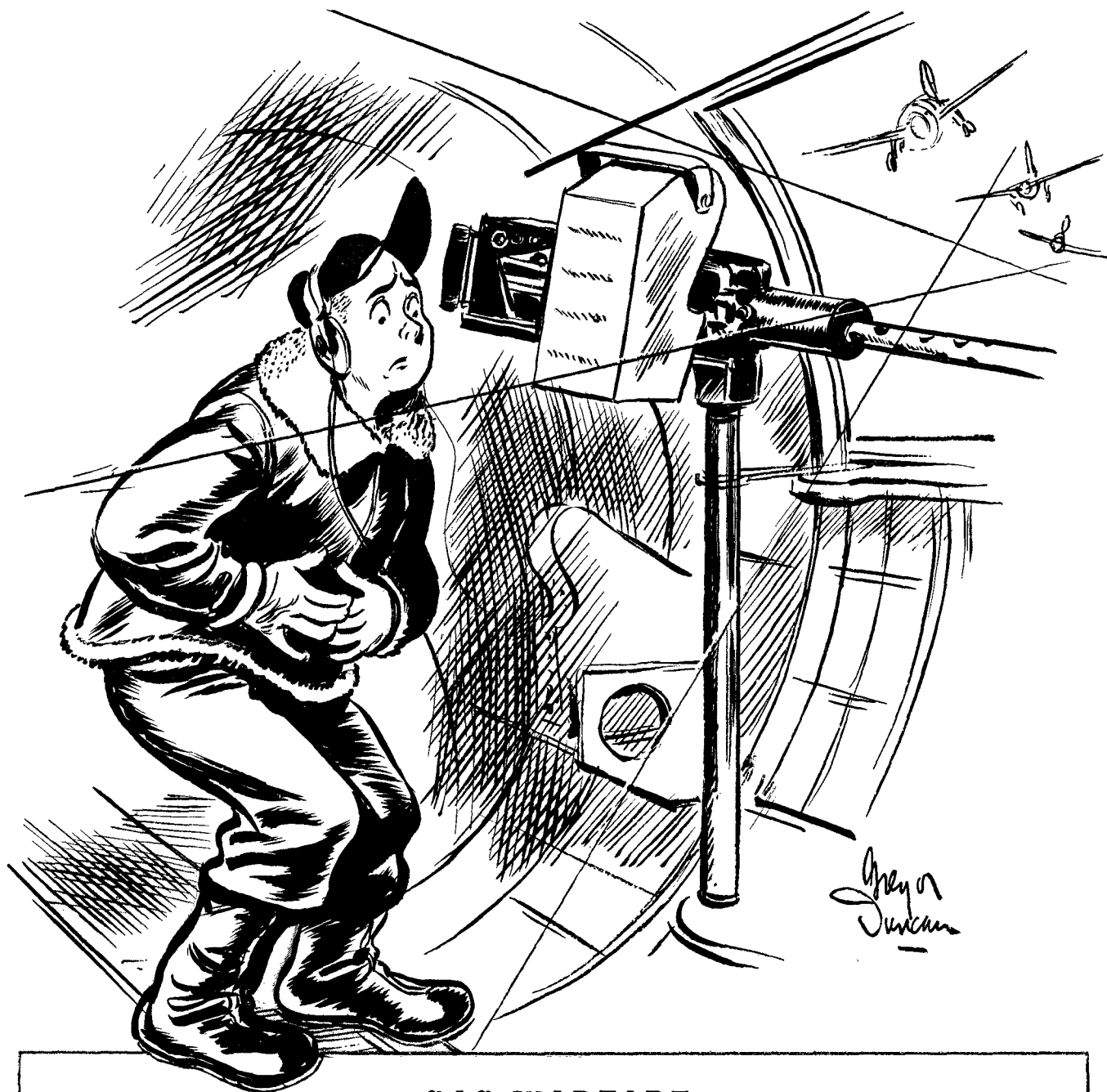
I was still waving when the searchlight turned slowly, deliberately, and pinned me in the middle of its shaft.

I sat down when the light hit me. All the strength went out of me and I flopped. I could hear the ship's dory being lowered from the cutter to come get me. I knew I was saved.

That was last February 8. For a long time after that, I thawed out in a string of general hospitals. When I got out, I went into a clothing store and bought some underwear.

I didn't just say: "Gimme four pairs of those things."

I said: "Gimme four pairs of UNDERWEAR . . . Cotton . . . Mississippi Cotton . . . the kind that'll burn." ☆



## GAS WARFARE

Gas attacks aren't confined to land operations. For example, Olly, the waist gunner, is suffering from the high altitude variety—abdominal cramps—from something he ate, no doubt. Must have been that strudel he had last night. Strudel doesn't like Olly.

But if strudel disagrees with Olly at ground level, it's bound to make him about ten times more uncomfortable at 30,000 feet.

Gas expands at high altitudes, and gaseous distress is also severely increased by a rapid rate of ascent. Cramps are

unpleasant and painful, but if your immediate concern is a Zero at eight o'clock, they can be dangerous.

The important thing is to avoid the most notorious of the gas-forming foods, such as dried beans, cooked cabbage, onions and the like. Remember the foods which cause you trouble and if possible eliminate them from your diet prior to a high altitude mission.

Olly's problem is strudel. Who knows? In your case it may be Egg Foo Yung. Make a note of it.

(Third of a series by the Flight Control Command.)





The first graduating class of our OCS held a few hundred men, representing all arms of the service of the Army and Air Corps in Australia and New Guinea. They had come from Port Moresby, Darwin, Sydney, Brisbane, Buna and all the remote fields and outposts of the Allied forces. They had come by air across the Coral Sea and by various types of ships down the coast, by truck over the highways of Australia and by the rattling trains that cut over and through the miles of mountainous coast. Singly, by threes and fours, wearing freshly-creased khakis and worn coveralls, they had straggled in until it was past the deadline. The school, scheduled to open on January 1, held its orientation day on the third, and the late arrivals had been given the privilege of attending extra classes to bring their work up-to-date.

Spit and polish at Miami, in the tradition of the line outfits, came in the form of forced compromise at Camp X, although the lack of laundry service was modified by the old army tradition of GI soap, brush and muscle. The fifty-pound limit on airborne baggage weakened the orthodox stand, for it limited the number of uniforms (if the man possessed a number of uniforms) against the articles the man did not care to risk to slower transportation. There was, of

**T**HIS is not a rebuttal. It is a direct result of the article "Look Proud Mister—You're at OCS" which appeared in the May, 1943 issue of *AIR FORCE*, and it was further impelled by the months of living and working with graduates of the Miami Beach school. The unfamiliar, dark-sounding term "bracing," the stories of formal retreats, the hours of standing at rigid attention beneath the Florida sun, the precise agony of preparing a hotel room for an all-comprehensive inspection, were so in variance with the routine of our OCS in Australia that this article was as natural as a newly dug slit trench after a surprise raid.

The original article, written by a graduate of the Miami Beach School, wandered into our palm-roofed native hut in New Guinea one day in July. It was raining again, meaning that the ceiling was down to the grass of the revetment area, the long dirt strip was heavy with mud, and the metal fighter strip was deceptively smooth with a thin layer of earth and water. Weather ships were flashing back reports that it was going to be that kind of day—a day for work in the shops, for a detailed study of news reports, for a hand in the floating poker game that was

certain to crop up again in the late afternoon or early evening.

That article in the May *AIR FORCE* held a definite interest for a member of the first class of the Officer Candidate School in Australia. The contrasts invited comparison. Magazines describing the Miami Beach school had always been in demand among the candidates from Down Under, because all of us had been fascinated by the hotels, the traditions and the bracing, the countless platoons drawn up for formation, and the nearness of Miami itself to air-conditioned clubs and sweeping beaches.

Miami vs. Camp X. A brilliant resort against a new camp in a forest near an Australian city. Luxury hotels and real mattresses against small huts and mattress-bare canvas cots. Thirty-six platoons at Miami, graduating before a grandstand of wives and relatives and friends, against one bob-tailed platoon marching across a dusty road to a hasty graduation before an audience of twenty civilians, the faculty and a few men of the camp who were free of duty that morning.

course, no compromise with neatness, promptness and obedience of the rules set forth in the blue booklet of regulations. The rules were there in black and white, open showers were available as a laundry, and boot polish was one of the few items on sale at the understocked PX. It was not all knife-edge trousers and crisply done shirts, but the morning formations were spruce and alert in the cool hour after dawn.

Men in the Air Corps platoon added up to interesting contrasts. There was one out of the Philippines, evacuated first to Java for duty in the rear gunner's cockpit of a dive bomber. Two others had been in the Java show before going to Australia. A bombardier out of a medium bomb outfit was there for the first formation. He had flown from Hawaii and had been in tightly calculated raids over Lac and Salamaua before their names were even faintly familiar to the people at home. Another, educated in a famous old New England prep school and in France and at Oxford, had come the long way from first experience in the Volunteer Ambulance Corps of Finland through a long siege in New Guinea to reach the new school. In the rear rank a long,

Illustrated by James T. Rawls

lanky, sardonic technical sergeant—with-out stripes—stood like a dark guidon. He had been with the British for eight months in 1941 on an educational mission with P-40s, in Egypt, Syria, Iraq, China, aboard the Clipper in the Philippines and Hawaii thirty days before war came. Beside him were two engineers, line chiefs out of fighter squadrons at Darwin, remembering their nine months in that far outpost of dust and heat and raids. There was a radio man in the formation, wearing old khakis not improved by hours of sitting on the floor of a stripped down transport as it bucked its way through storms over the Coral Sea. He had been at Milne Bay for four months and he was deeply impressed by the brown dust of Camp X. There hadn't been any dust at that humid, rain-soaked tip of New Guinea.

The platoon held sergeant-majors, first sergeants, engineers, bombardiers, armorers, radio men—one with 3,000 hours in the big ships—personnel men out of the big headquarters, supply sergeants. And even a basic, whose total freedom from technical training and an even cleaner record in the Panama infantry had caused sorrow to the statistical officers of the Air Corps when they first tried to place the square peg in the round hole. The men came out of service groups, fighter squad-

## The first AAF officer candidates in the school Down Under led a double life with the Infantry, Engineers and Field Artillery.

was to be a twelve-week course, divided equally between basic and specialized training. It was expected that all men would conform without difficulty to the rigorous routine since the average length of service indicated that experience had fitted them for the correct drill, courtesy and discipline demanded by the school. The faculty was to proceed on the premise that the candidates were soldiers, qualified not only by past training but by actual service in the fields of maneuvers and combat. The fact that a good percentage had returned from forward areas was to permit no relaxing influence on the discipline of the school.

Brief, clear—leaving no room for misinterpretation.

The six weeks of basic began with thirty long minutes of physical drill. The entire student body worked out before an uncompromising instructor who machine-gunned the drill with speed and precision and, we thought, an unwarranted premeditation. It hurt, because New Guinea and the Northern Territory, with months

the Engineers, and attended class with the Field Artillery. It meant that the major of Artillery would make reference to batteries and battalions, and the Air Corps candidates would commit the unforgivable by translating the terms into their equivalents of flights and squadrons. On those five-mile hikes through the marshes and over the sudden hills of the surrounding forest, carrying a map board, coordinate square and ruler, the long-legged major walked the class into the ground. "I want the grid coordinates of this culvert, gentlemen," he would say striding along while your half-empty canteen nudged the hip suggestively, with two hours of the Australian tropical summer heat ahead.

There was Judo and bayonet drill, brawling in the dust of the barrack area, learning the fine art of killing with civilized efficiency and extreme dispatch. Night problems in scouting and patrolling were interspersed with those sessions on a hillside at midnight. With an immense open plain as the stage, we listened to the invisible instructor lecture on time-distance, on the correct method of cutting through wire emplacements. We listened for the sound of muffled cutting tools, for the sound of a rifle bolt as it was drawn quietly and for the instructor who would ask: "A thousand yards? Five



**By Lieut. W. F. HOUHA**

**COMMUNICATIONS OFFICER WITH AN ATTACK GROUP  
IN THE SOUTH PACIFIC**

rons, medium and heavy bombardment outfits, from isolated units operating independently in a vacuum and from units under the critical eye of the commander in chief. They covered the Air Corps like Joseph's cloak.

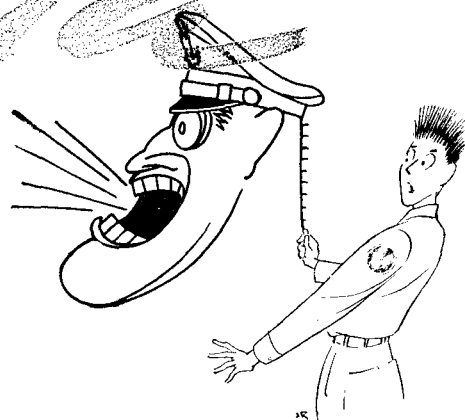
We formed in the rain, that first morning, marched across the road onto the parade ground and sat down on persistently wet grass to listen to the orientation speeches by the colonels, majors and captains—the officers who had been assigned the duty of training us to become officers. The Air Corps platoon felt out of place in that company with no familiar, reassuring silver wings in sight. The crossed rifles of the Infantry, the cannon of the Artillery, the colorful flags of the Signal Corps and the Ordnance bomb—but no wings. The colonel made a careful effort to welcome the section, but when all eyes turned to appraise critically, the eight ball lifted its shadow.

The brief introductions told us that it

of field rations, dawn pre-flights and night stand-byes, had not been conducive to top physical condition. The familiar black-out effect of the tropics threatened to end that half hour prematurely for a few, but they steadied against the giddiness and held on. They had come too far to permit losing out in the beginning.

Rifle drill, military courtesy and discipline, military law, map reading and aerial photography, mess management, chemical warfare, company administration, symbols. Disciplinary drill on the narrow company road. The high-pitched pleading of the second lieutenant of Infantry, out of Panama, assigned as our platoon commander, to remember that we were not in the Air Corps for those six weeks, but in the Infantry. To remember the look of deep agony on his face when one of us would call the "squadron" to attention, instead of the "squad," is sheer pleasure, now that it's all over.

We had a split life down there. We lived and drilled with the Infantry and



hundred? How many men are coming through the wire?" We watched, grimly fascinated, as a guard walked post and a silent figure, visible for a brief instant in the shadowy beam of a flashlight, stepped high and softly in the tall grass to go into precise motion, hitting hard and whipping a length of slender cord around the guard's neck and ankles.

We advanced through the woods of Hill 200, against the waiting snipers, invisible against the foliage in their perfectly blended jungle suits, and felt the familiar quickening of the heart again, as if the off-beat of the enemy bombers, or the sudden, shattering sound of strafing planes was near. We went for cover

when the engineers blasted a deep set charge to send rocks and splinters in a cascading shower over a hundred yard area. They gave us shovels and picks, and taught us the exact art of digging a dive trench. To most of us, that was really gilding the lily. If there was a job to be done, they saw to it that it was our job.

It wasn't easy, not even for the Infantry veterans of the Buna campaign. But no alibis were accepted and none were given. The man called out of ranks to handle his squad or platoon was expected to whip out commands with clear authority and decision. If he was given the order to instruct for ten minutes on an intricate phase of the Manual of Arms, a ranking officer was there, studying his voice, manner and confidence. The man who faced his squad into the sun during a brief lecture, the man who showed indecision in a crowded drill area—these were the men marked down for a later meeting with the Board. We did have the Board, as part of our tradition.

THE school made its mark. The instructors drilled unceasingly upon the need to conquer the assigned subjects, not only to earn the coveted commission but to gain the confidence so necessary to instruct the men an officer had to command. It was the Infantry speaking, but to all of us it was the Old Army. The Old Army that has always been a gigantic school, steadily pushing a difficult curriculum against a vital need. The instructors made us alive to the fact that as officers we had to know men and had to be capable of accepting responsibility with assurance and accuracy of judgment. It was a big order. It all could have been defined with one word: Responsibility.

It wasn't all work, of course. The faculty recognized the need for a break in the routine and permitted freedom from 1700 hours Saturday to 1900 hours Sunday. This ruling was subject, through an unusual provision in the school regulations,

to rescinding at the discretion of the CO. Our first three Sundays were spent pacifying the Old Man's wish that a road be built through the area—with a bridge where it was needed—and that an obstacle course be engineered in a remote section of the camp to further plague the candidates. After those jobs were completed, the Sundays were free. Unless a man was fortunate enough to pull a Saturday night guard.

A free half day was granted on alternate weeks to allow the men to go into town for necessary purchases. The half day permitted candidates to make the fifteen-mile, transportationless (unless one considered the shyly hesitant 1:38 train) journey to town in time to hurtle into a pub minutes before the last ounce of beer drained out of the kegs, to get a meal in a crowded restaurant, to make reservations for the Saturday night cinema, and to shop without hope in the stores that had so little to offer after three years of war. The streets of the big town were filled with service men and service women. Sailors. Air Corps men on leave from the North. Australian WAAFS. Diggers with triangular patches on their hats of the famous upturned brims, showing that they were veterans of the returned A.I.F. from Tobruk and the Middle East. Sailors from a Free French destroyer, very Gallic in immaculate white shorts and shirts, gesticulating sharply as they paraded through the crowds. The stolid jungle green uniforms of the Dutch, so amazingly heavy for the tropical sun. MPs and the Navy's Shore Patrol, walking easily, swinging short clubs and tolerantly ordering celebrants to button up that shirt, to fix that tie.

The blue OCS badge brought on questioning, for it had not been there before. What did it mean? What outfit was you guys with? When did you get over from the States? We offered the modestly satisfying reply to all street and pub questioners that we were members of the

newly formed Overseas Cargo Service, that we had just arrived from the States, and that we were returning Tuesday weather permitting.

The first six weeks went swiftly after the first week, with its initial shock of drill, discipline and endless lectures, had finally come to an end. The tempo of the drill increased. The morning physicals began to take on a snap and precision that brought a grudging gleam of approval to the critical eyes of the line officers who invariably happened to be standing by as the Air Corps went through the morning drill. The weary afternoons of rifle dry runs, of lying in the dust with the sun beating heavily down and an instructor walking behind the line, prodding: "Get those heels down, bring that elbow under, get that strap clear up to the armpit and your thumb across the stock," finally led to a full day on the range and the good feel of the jar of the rifle flowing through the arm. There are not many satisfactions as great as watching the marker come up to cover the black circle.

We had no ceremony, of course, when the second half of the course began for there was no senior class. We were given one farewell speech, when the colonel of Field Artillery put away the last field manual, leaned on the tiny rostrum and said: "We of the Field Artillery have enjoyed having the Air Corps with us for these past six weeks. You have been good students and soldiers. If you ever want to transfer to a real outfit, the Field Artillery will be very glad to have you."

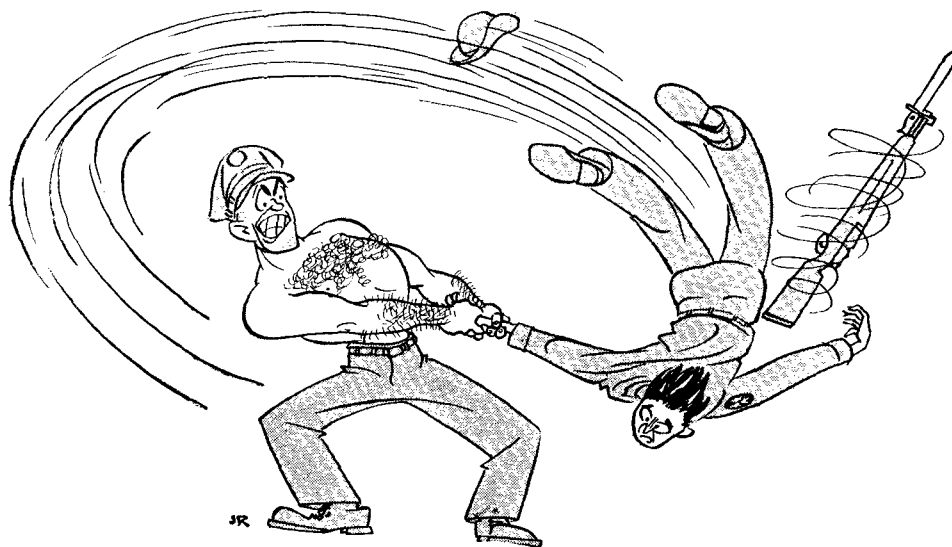
It was, we wished to believe, a compliment. It did mean that we had been accepted.

The Infantry went into the field with its machine guns, howitzers, rifles and packs. The Engineers reached for their instruments and manuals, and anticipated without anticipation the building of roads, emplacements, the hurdling of the wide, nearby river by pontoon bridge. The Air Corps went into Administration.

A Miami graduate would be familiar with the routine. There were only a few cardinal differences. The majority of the instructors were staff officers from Air Force headquarters, each dealing with his specialty. They talked directly from experience, without textbooks, and were often backed to the wall by the practical questions of students who had been waiting for months to ask about supply, delays, equipment and a hundred other matters that had boiled over during the months overseas.

They gave us brief lectures on engineering, the theory of flight, instruments, weather, communications—on all technical subjects—to acquaint us, they explained thoughtfully, eyeing the average service of 31 months, with the terminology of the Air Corps.

A navigator (Continued on Page 53)





# LIFE RAFT EXPERIMENT

*The following article is based on the combined observations and conclusions of three officers who played important roles in a life raft experiment conducted on the Gulf of Mexico several weeks ago. They are Maj. George W. Holt, director of air medicine at the AAF School of Applied Tactics; Maj. M. W. Boynton, surgeon of the Flight Control Command, and Capt. George H. Waltz, chief of the air-sea rescue section of the FCC.—THE EDITOR*

A FEW weeks ago, two rubber life rafts could be seen drifting in the Gulf of Mexico twenty miles off a Florida base. To all appearances, they held the survivors of a crash landing at sea. Actually, the occupants were officers and enlisted men who had volunteered to test the rafts and the equipment and rations furnished for emergencies on our bombardment aircraft.

The experiment, which lasted six days and six nights, was under joint supervision of the Flight Control Command and the medical branch of the AAF School of Applied Tactics. It was made to determine the following:

1. The desirability of drinking lots of water prior to long over-water flights.

2. The advantages or disadvantages of keeping the clothing saturated with sea water in an attempt to prevent perspiration and thereby conserve body fluids.

3. The relationship of such factors as exercise and solar exposure to the rate of dehydration.

4. The advisability of drinking large amounts of water when it becomes available after prolonged dehydration, as compared with drinking small amounts at frequent intervals and hoarding the remainder.

5. The effectiveness of various sunburn lotions and creams.

6. The desirability of including certain items of diet now provided as emergency rations.

7. The practicability of all equipment in life raft kits.

The test also was intended to provide a source of information, based on controlled practical experience, for teaching purposes.

At 1630 on a Sunday nine officers and enlisted men, wearing summer flying suits, fatigue hats, socks and shoes, went overboard from the Army Crash Boat P-269 into the two life rafts. For the next 135 hours, or until approximately 0600 the following Saturday, all but one of these men remained constantly on the rafts, except for short periods on board the attending crash boat where daily medical studies were made. Thus, most of each day and all of each night were spent on the rafts, affording a good opportunity to study both the equipment and the physical and mental reactions of the men aboard the rafts.

During the first night, five men occupied the A-3 (1,000-pound capacity) raft and four men the E-2 (2,500-pound capacity) raft. Throughout the night a severe rain and wind storm kept the rafts and their crews constantly alert and continually drenched with sea water. Sleep was impossible. After the first few hours

**Some conclusions reached after eight officers and men spent six days and nights on the Gulf testing raft equipment.**

of wind, rain and heavy seas, one of the four men on the E-2 raft became so violently seasick that he had to be taken off the raft and subsequently moved to a hospital on shore where he remained for 36 hours. This man lost eight and a half pounds during the night and went into shock so severe that neither his pulse nor his blood pressure were obtainable at times. He also became disoriented and confused. From his experience it became quite evident that seasickness can become severe enough to a man adrift on a life raft to result in death.

**THE** next morning, inspection of the kits fastened to the floors of the life rafts showed that because of the lack of watertight closures on the kit containers almost half of the equipment was ruined and had to be discarded. Signal flares were soggy and unusable, the first-aid kit was completely soaked in sea water, the Very pistol was badly rusted as was a .45-caliber automatic pistol placed in the A-3 raft kit for safekeeping, and the rubber patching kit was so badly water-soaked that it could not have been used to repair even a small puncture or rip in the raft. **MORAL:** Inspect the life-raft kit in your airplane and place flares, first-aid kit and any other pieces you feel may be ruined by salt water, in waterproof bags. If you can get them, waterproof icebox bags are satisfactory. Grease your knife, Very pistol and automatic before every long over-water flight.

Because of the extreme crowding on the A-3 raft, two of the five men moved to the larger raft the following morning, and for the rest of the test three men occupied the A-3 and five men the E-2.

To make the test as complete as possible, various duties were assigned each man. Throughout the following day, the men on the smaller raft attempted to protect themselves from the sun by stretching a tarpaulin over the raft, while the men on the E-2 raft had no such protection. The men on the larger raft felt the effects of dehydration considerably more than the men on the A-3 raft. **MORAL:** Use your oars, sail and/or tarpaulin, yellow side up, to rig a canopy over your raft. Besides protecting you, it will make your raft easier to see.

During the first 24 hours, none of the men had either food or water. After that, seven of the eight men were given a reduced ration of one standard K ration box and 330 cc (approximately two-thirds of a pint) of water a day, while the eighth man continued to do without food or water for four days and four nights. A 38-year-old medical officer, he experienced no great hunger or thirst after the initial period of accommodation to conditions, indicating that with proper self-imposed discipline even a considerably longer period of fasting is possible for anyone in good physical condition. As a matter of

fact, this officer, without food and water, felt thirst far less than the average of the other men who had their daily ration of food. **MORAL:** When you have no water, don't eat dehydrated or dried heavy foods.

Before going on the raft, this officer had fortified himself by drinking large quantities of fluids—the total equal to more than three times his usual daily consumption. To this and to the fact that, although an inveterate smoker, he stopped smoking when he got aboard the raft, he attributed his lack of any great feeling of thirst for the 96-hour period. **MORALS:** Drink all the liquids you can comfortably hold before and during all long overwater flights. Don't smoke if you have no water.

On the third day, two of the men were so completely dehydrated that an additional water ration became necessary. The men were weak and mentally confused. Each was given two quarts of water,



**Taking part in the experiment.**

which he drank within an hour. Contrary to general belief, they experienced no feeling of nausea but quite the reverse—a feeling of renewed strength and a brighter mental attitude. A careful medical check of these men during the next 36 hours showed that they retained most of the water taken. **MORAL:** If you collect rain water, immediately drink as much of it as you can comfortably hold. Your body can store water and it makes a far better container than a bailing bucket or a tin can. Store the rest, preferably in the regulation water cans which you have already emptied. Some of the water taken in large quantities when you are dehydrated is lost through perspiration or excessive urination. However, a quart of water in your body is worth several quarts stored where they may be lost if the raft tips over or spoiled by sea spray.

For the duration of the test, one man kept his clothes continually wet with sea water and at the same time kept himself out of the sun as much as possible. Without any greater feeling of thirst than the rest of the men, he was able to exist with

considerably less than the regular daily ration of water. **MORAL:** In shark-free waters and warm climates during sun up hours dunk yourself, clothes and all, periodically. Lower yourself over the side slowly to keep your face and mouth out of the sea water. Don't exert yourself by swimming, just hang onto the hand line. If one's general condition precludes dunking, the clothes may be splashed with sea water.

During the third and fourth days, two men with little previous fishing experience were detailed to test the life-raft fishing kit. They were handed the kit and given no further instructions. Selecting the largest hooks and lines, they fished for several hours. Result: No fish. It was then suggested that they try the smaller hooks and pork-rind bait provided in the kit. Within twenty minutes a small fish was hauled aboard. It was cut up for bait and used on the larger hooks. Within an hour, two ten- or twelve-pound fish had been caught. **MORAL:** Don't go after the big fish first. Catch small ones with your small hooks baited with pork-rind and cut up the small fry for baiting the larger hooks. Don't try to hook excessively large fish, for they will only break your line and run off with your hooks and bait.

**MEDICAL** tests made before, during and after the experiment showed total weight losses ranging from one to ten pounds with the average loss somewhat over a pound a day for each volunteer during the six-day period. The thinnest men at the start lost the most at the end, the fattest the least.

Except for a general weariness and mental fatigue, there were few changes physically in the men. A comparison of the results of the physical examinations for flying (W.D. A.G.O. Form No. 6-1) given before the start of the test and those given at the conclusion showed only minor variations.

The circulatory systems as measured by electrocardiogram, pulse, blood pressure and Schneider index showed no evidence of deterioration. The eyesight of all volunteers remained normal in spite of the daily exposure to wind and sun.

The greatest single factor contributing to the general weakness which first evidenced itself on the second day was the inability to get comfortable enough in the rafts for restful sleep. The best position was found to be crosswise with the men alternating feet first and head first, but even in that position it was difficult to sleep for more than a half to three-quarters of an hour at a time.

Out of the test also came a number of suggestions for additions and changes in the life-raft rations and medical kit and life-raft equipment kit. These recommendations are being passed on to the proper agencies for consideration. ☆



# AAF TRAINING COMMAND

## Our training operations following consolidation of the Flying Training and Technical Training Commands.

**I**T is difficult to comprehend the time, effort and money necessary to train the ground and air crewmen for just one American bomber.

But we do know that for one bomber the training assignment is immense. The pilot gets a \$25,000 course in which he learns to guide his four-engine Fortress or Liberator, and to fly on three motors and on two through night and storm. The navigator is an expert at tracing reliable paths through strange skies. Weeks of mind and body-wracking study give the

bombardier a right to boast, "I can put 'em in a pickle barrel." Gunners fire thousands of rounds of skeet, .22 cartridges, 12-gauge shotgun shells, .50- and .30-caliber bullets before they are judged ready to put the sting in our bombers.

The mechanics first become intimate with propellers, instruments, engines, hydraulics, electrical and fuel systems, and the other working parts of aircraft before they are ready as maintenance specialists. There has to be a system to teach the armorer about electricity, how to assemble

machine guns blindfolded, how to load ammunition and bombs and adjust power turrets. The radio man learns to send and receive, repair, maintain and install aircraft radio, and to master operational and airdrome tower procedure.

There are the parachute riggers, weather forecasters and observers, and many more.

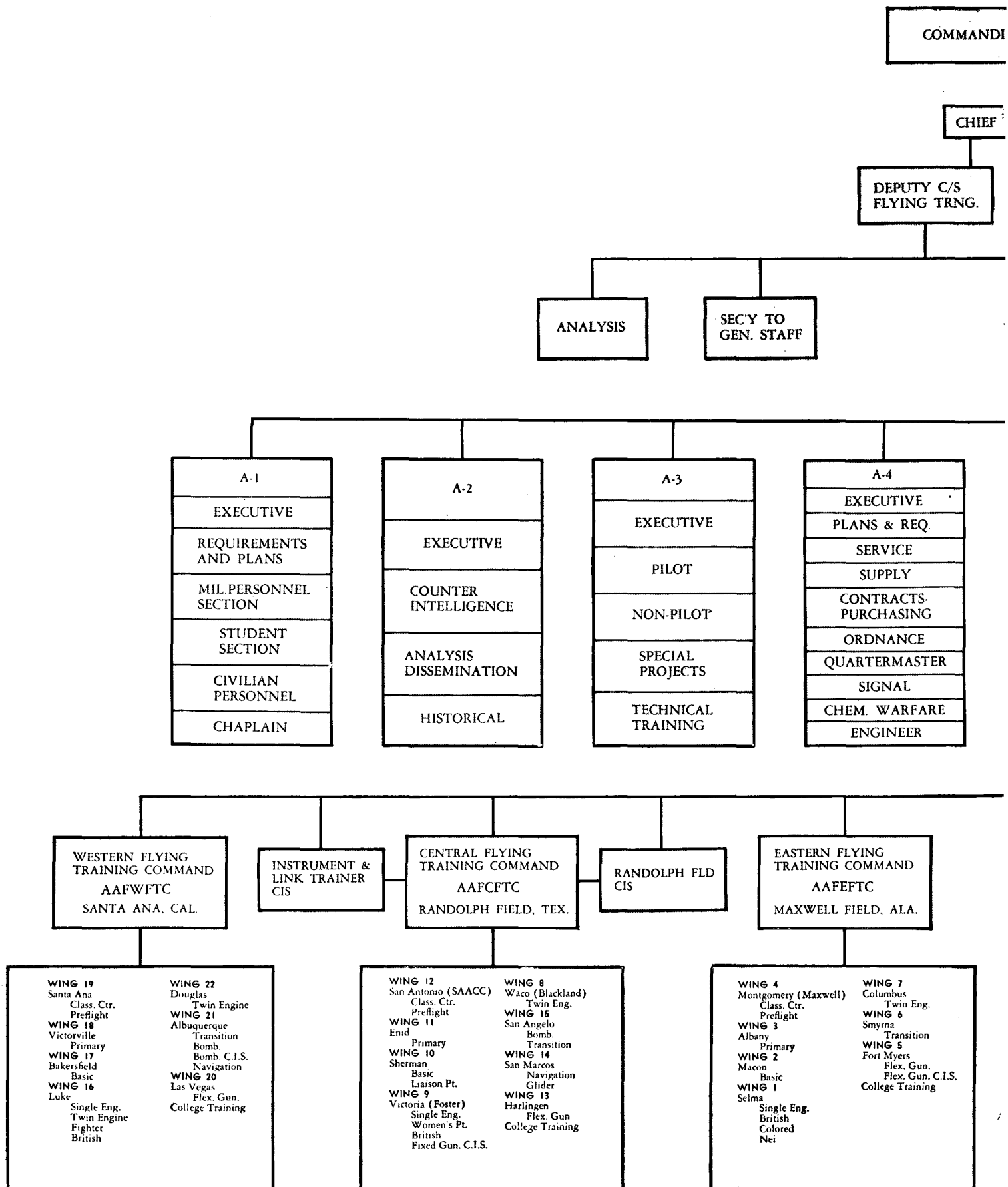
Multiply the problems involved in manning that one plane by the total of all the bombers, fighters, trainers, gliders and miscellaneous types (Continued on Page 30)

**General Yount (seated) and the commanding generals of the flying and technical training commands (left to right), Generals Hanley, Fickel, Brant, Curry, Cousins and Martin.**



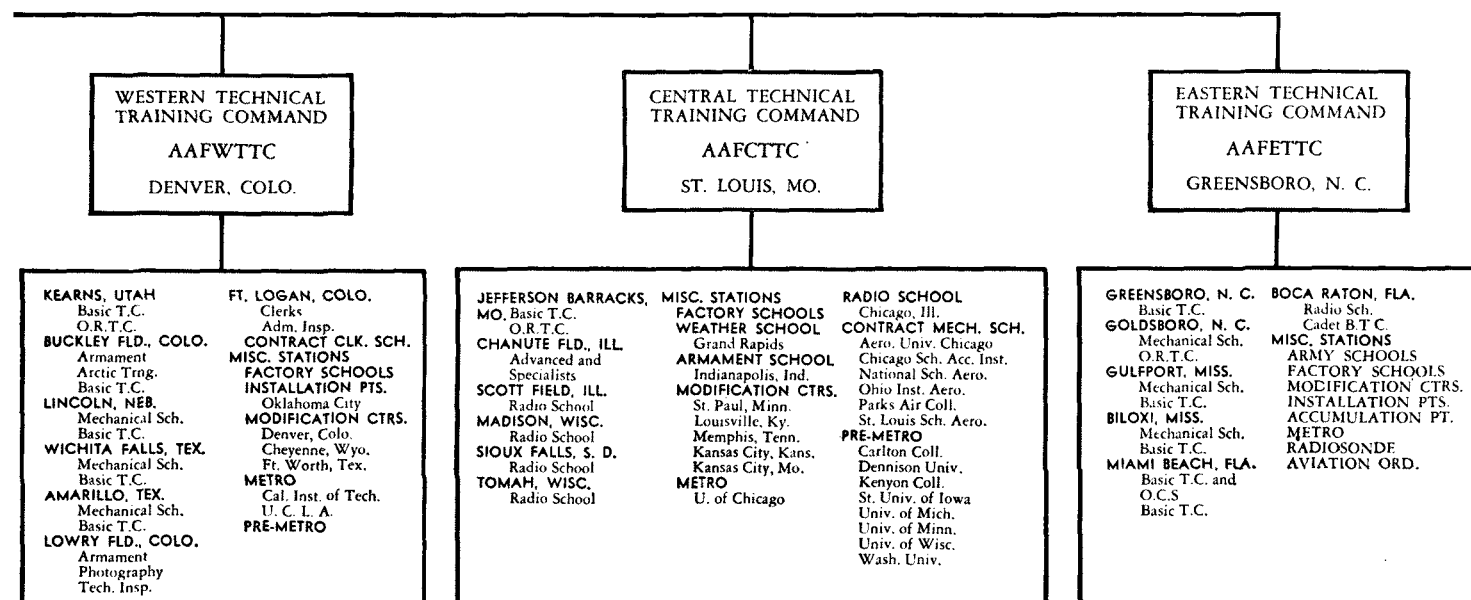
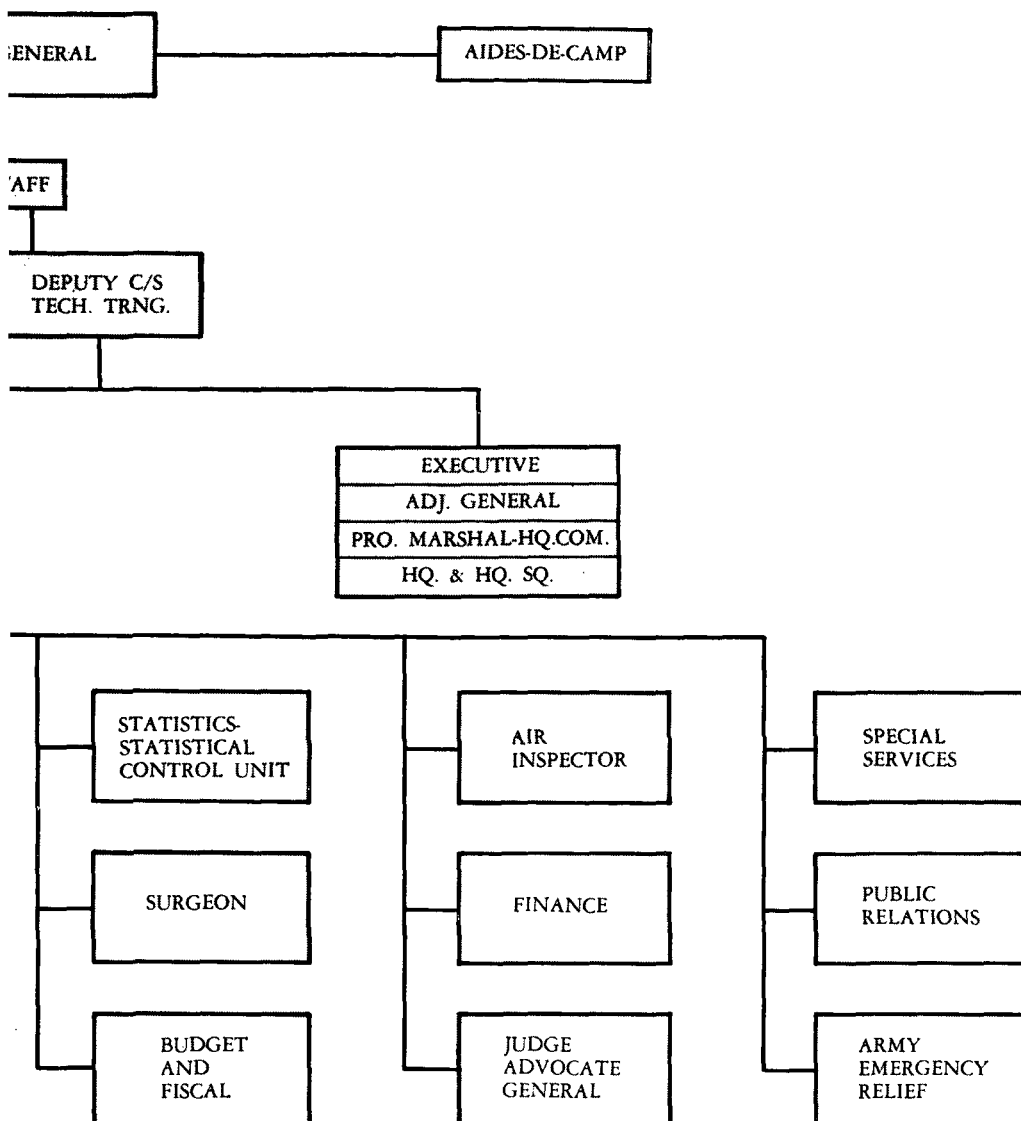
# ORGANIZATION ARMY AIR FORCE

(COMBINING AAF AND ARMY AIR FORCE)



# FORCES TRAINING COMMAND

(C AND AAFCTTC)



of aircraft that constitute the greatest air arm in history, and you may get an idea of the responsibilities which rest upon the Army Air Forces' newest agency—the Training Command.

The AAF Training Command is new, but the two parts of which it is composed already were well-known and respected, each in its own right, for the importance of their individual operations.

The Flying Training Command had accomplished the task of supplying the personnel for an air force sufficiently powerful to turn back an enemy that had a big edge in the beginning. Its alumni are the pilots, bombardiers, gunners and navigators who have written their names in destroyed Axis planes and properties in Europe, the Aleutians, North Africa and New Guinea.

The Technical Training Command made possible the attainment of the ultimate goal of the flying training organization. For, without TTC's mechanics, technicians and other ground-experts, there would have been no planes to fly, no guns to shoot, no bombs to drop.

Flying and technical training always have been blood-brothers. There were common problems which often brought officials of the two programs together. And, of course, there were countless common interests and, most important of all, the mutual desire for victory.

It was but a natural blending when, on July 7, 1943, the War Department announced that the Flying Training Command and the Technical Training Command would be consolidated to form the Army Air Forces Training Command. Maj. Gen. Barton K. Yount, who had been chief of the flying training program, was named commanding general of the new twofold Command.

Integration and streamlining of the air and ground training mission of the AAF was accomplished to achieve an even greater coordination in effort. The reorganization calls for maximum efficiency in operation, with a minimum of staff personnel and disruption of current activity.

In addition to Brig. Gen. Walter F. Kraus, presently appointed chief of staff, General Yount's headquarters in Fort Worth, Texas, now includes Brig. Gen. William W. Welsh as deputy chief of staff for flying training, and Col. John P. McConnell as deputy chief of staff for technical training.

The consolidated Command represents the largest such unit within the Army with headquarters outside Washington.

The new Command is nationwide in scope. It has been divided geographically into western, central and eastern areas, within which flying and technical training functions will be closely coordinated.

Flying Training Centers, (West Coast, Gulf Coast and Southeast) which existed under the old Flying Training Command, have been redesignated respectively as

## AAF TRAINING COMMAND

(Continued from Page 27)

the Western Flying Training Command, Central Flying Training Command and Eastern Flying Training Command. Headquarters remain the same, with Maj. Gen. Ralph Cousins commanding the WFTC at Santa Ana, Calif.; Maj. Gen. Gerald C. Brant, the CFTC at Randolph Field, Texas, and Maj. Gen. Thomas J. Hanley, the EFTC at Maxwell Field, Ala.

Flying Training Wings, each commanded by a general officer, will continue to operate within each of the three Flying Training Commands. Established on a purely functional basis, training wings will serve to coordinate training activities at the various specialized schools in accordance with directives from higher headquarters. In the WFTC, two wing headquarters are located at Santa Ana, Calif. Others are at Bakersfield, Calif., Luke Field, Ariz., Douglas, Ariz., Albuquerque, N. Mex., and Las Vegas, Nev.

Wing headquarters in the CFTC are at Enid, Okla., and at San Antonio, Sherman, Victoria, Waco, San Angelo, San Marcos and Harlingen, all in Texas.

EFTC wings are located at Montgomery, Ala., Valdosta, Ga., Macon, Ga., Selma, Ala., Columbus, Miss., Smyrna, Tenn., and Fort Myers, Fla.

The five former technical training districts have been consolidated into three Technical Training Commands. The reorganization provides for the inactivation of the old Technical Training Command headquarters at Knollwood Field, N. C., and of the Third and Fifth Technical Training Districts, with headquarters at Tulsa, Okla., and Miami, Fla. Facilities at Tulsa and at Miami were reassigned to the three new Technical Training Commands, effective August 31, 1943.

Commanding the new Western Technical Training Command, with headquarters at Denver, Colo., is Maj. Gen.

John F. Curry; Central Technical Training Command, St. Louis, Mo., Maj. Gen. Frederick L. Martin, and Eastern Technical Training Command, Greensboro, N. C., Maj. Gen. J. E. Fickel.

Individually, the Flying Training Command and the Technical Training Command were conducting coast-to-coast activities which staggered the imagination. The over-all program, vested today with the job of producing the complete manpower needed to win an air war, is almost beyond comprehension. The duties of the new Training Command constitute a serious challenge, and one which must and will be met successfully.

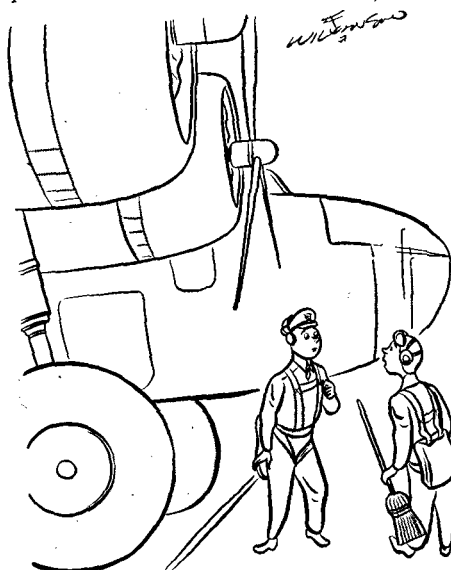
From the Atlantic to the Pacific, from the Gulf of Mexico to the Canadian border, there are college training programs in progress for future aviation cadets; pre-flight and classification schools; elementary, basic and twin-engine and single-engine advanced schools for pilots; two- and four-engine pilot transition schools; bombardier, navigation and gunnery schools; Central Instructor Schools for "teachers" of flying, bombardiering and gunnery; liaison pilot schools and others for West Point cadets, women ferry pilots, glider pilots and foreign nationals.

The Training Command, on the technical side, will conduct the AAF Intelligence School at Harrisburg, Pa.; Administrative Inspectors' School at Fort Logan, Colo.; Photographic Officer Pilot School at Lowry Field, Colo.; Administrative Officer Candidates School at Miami Beach, Fla. and the Statistical Officers' School at Cambridge, Mass. In addition, there are scores of schools for airplane mechanics, aircraft machinists, sheetmetal workers and welders, armorers, parachute riggers, radiomen, glider mechanics, aerial photographers, weather observers, weather forecasters, teletype maintenance men, and for aviation cadets who will be trained for the duties and responsibilities of technical officers.

Two paralleling organizations have been dovetailed naturally into one smooth production line. Bringing them under the jurisdiction and direction of the same authority will coordinate training with requirements, changes with developments and manpower with machines.

Key personnel of the TTC are moving into enlarged office space in the former FTC headquarters building in Fort Worth, a city chosen because of its central locality and ready accessibility to every flying training field in the nation by military or commercial aircraft.

The Training Command's prescribed task is to see that the two endeavors of flying and technical training are performed as one in the most efficient manner possible. Officials in Fort Worth, officers and men at the many stations, and cadets and students in every corner of the United States intend that this task shall be accomplished. ★



"Didn't you say we are going to sweep the channel?" —FRITZ WILKINSON

The P-51 is the AAF's only "war baby" now in combat.

With no family tree of design precedent, the P-51 was conceived seven months after the Nazis invaded Poland, carried from the idea stage to a warplane when the Germans were marching through Western Europe and taken on its maiden combat flight after the fall of France. The British called it the Mustang, "tough, maneuverable, no vices."

Today, American and British fighter pilots are receiving a new P-51, a high-altitude version of the Mustang, powered with the Packard-built Rolls-Royce Merlin engine. In this version, critical altitude and horsepower of the plane have been increased greatly by the Merlin engine with its two-stage supercharger. Wing design changes have raised the fuel capacity, giving it greater range than any other single-engine fighter.

Test pilots are enthusiastic in their praise of the new P-51 models. They like its speed, high-altitude performance and ease of handling. A combat veteran, after testing the ship, likened the controls and handling instruction to those of the AT-6 and said he felt as if he had "just attended old home week and met an old friend."

Rapid response to the controls and ease of handling are also characteristic of the early P-51, but modified control surfaces make them even more pronounced in the later version. Other factors which contribute to these features and add to the pilot's convenience are automatic oil and prestone shutters, automatic supercharger control, simplified gas system and a device which automatically locks the tail wheel in fore and aft position whenever the elevator control stick is in a position aft of neutral.

Years of testing, research and experimentation usually precede the production of a combat plane. The P-40 was developed from the P-36, the P-47 was an improvement of the P-43, and the P-38, an original design, was conceived long before the war and was on the production line before December 7, 1941. Not so with the P-51. It was dreamed up seven months after the war began, designed and built in 100 days and put into production the same year.

Although the AAF received two of the first Mustangs built and conducted extensive experimentation with the planes, the credit for the original design and construction goes to North American Aviation, Inc.

In April, 1940, the British asked North American to build on subcontract a fighter already in production by another company. North American countered with a proposal that an entirely new

plane be created to incorporate the latest findings in aerodynamics and combat experience. The British agreed, providing a 120-day deadline could be met, an inline engine used and provisions made for specified armament.

The project was turned over to the company's engineering department. Edgar Schmued, chief design engineer, and his staff began work on a Saturday afternoon and worked all night to complete an in-board profile for inspection by the company president Sunday morning. This and a preliminary weight estimate were approved, and the company accepted the British deadline.

More than 2,800 original design drawings were needed, and the work of producing them was divided among specialists in power plant, landing gear, tail section, armament and the like.

From skeleton specifications, sketches, personal check-ups and constant revisions, the "specs" were finally turned out and sent to the experimental shop where a full-size wooden mock-up was being made by a crew working day and night, to the wind tunnel group which was carving a \$20,000 quarter-size model from laminated mahogany to tolerance as fine as .001 of an inch, to loftsmen who were laying out the full-scale drawings from which the templates used in production were to be made, and to the purchasing department which rushed the parts on verbal instructions from Schmued.

Best known of the advanced ideas brought into the design was the so-called "laminar flow" wing, based on principles

developed by NACA in extensive wind tunnel research. Schmued and Edward Horkey, young aerodynamic expert, believed in it thoroughly but a trick of circumstances almost negated their work. First wind tunnel tests indicated some bad stall characteristics, so they took the wing to a larger tunnel where it worked perfectly and became a major factor in the plane's speed.

The inline Allison was used to reduce the frontal area as much as possible. However, use of the liquid-cooled engine presented a problem in a large, drag-producing radiator scoop, usually placed in the nose. It was relocated underneath the fuselage. When, however, the engine heated up in flight tests, additional wind tunnel tests revealed that the turbulent boundary layer of air under the fuselage was entering the scoop and destroying the efficiency of the cooling system. By lowering the lip away from the bottom of the fuselage, engineers were able to sidetrack the turbulent air and attain circulation of "clean air."

Not all new ideas were successful. A semi-spherical, molded plastic windshield so distorted pilot vision that the regular flat windshield had to be substituted.

With a ton of engine and propeller in the nose exerting terrific forces in hard pullouts, bad landings and acrobatics, strength was essential. Pressure and weight tests of all kinds had to be made on the wings, including the piling of 80,000 pounds of weights on them.

A rumble caused by pulsations in the cooling air scoop was eliminated when the air scoop was lengthened and moved slightly outside the boundary layer of air close to the fuselage.

A streamlined radio mast that had worked perfectly on other planes vibrated badly and snapped off at the high speeds of the P-51. This was solved when an engineer took a steel tube, smashed it almost flat and installed it with the narrow axis in the direction of flight.

The finished product weighed approximately 8,000 pounds, with a wingspread of 37 feet and an over-all length of 32 feet.

The P-51 passed its factory flight tests successfully and on Armistice Day, 1941, made its first flight in England—but only after British anti-aircraft batteries had been warned of the appearance of a new fighter which closely resembled the Messerschmitt in silhouette.

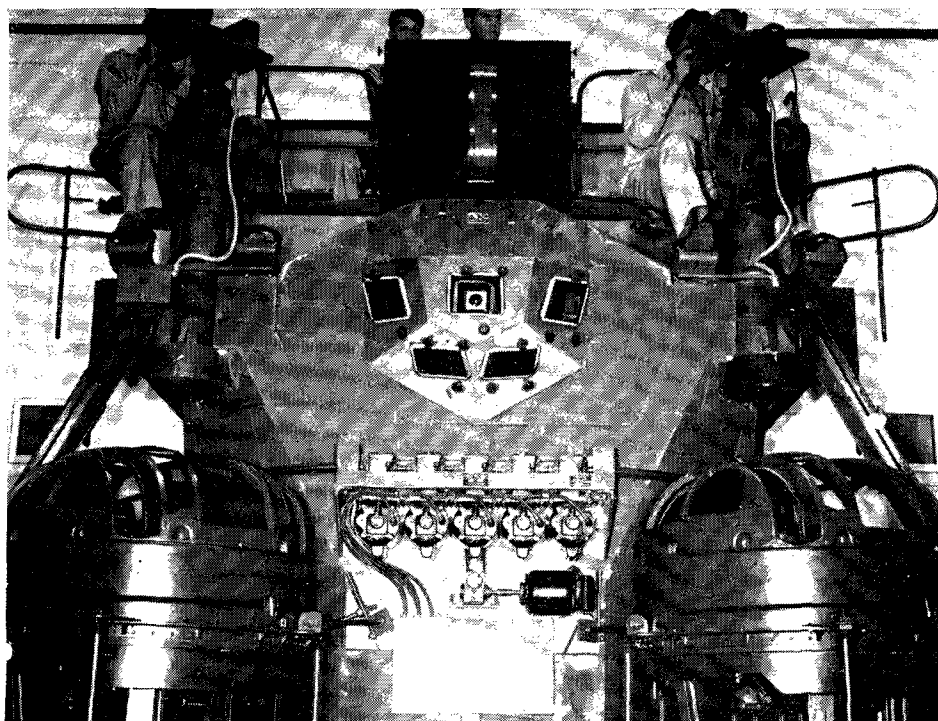
Later, the Nazis were confused in identifying the new plane on its first flight over one of their airdromes, and they paid a heavy price.

And they are still paying. ☆

(Technique Continued)





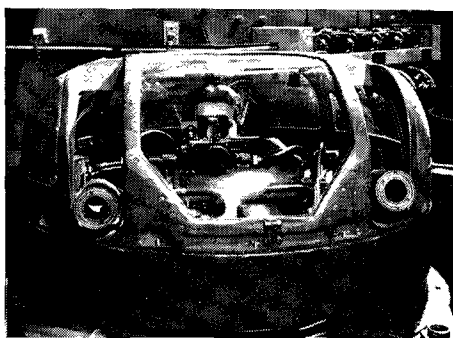


Front view shows instructor's position in upper center, two hand-held gun positions and two turret positions. In the center are the projection ports of the five projectors.

### Waller Gunnery Trainer

Utilizing all the latest Hollywood technical features, the AAF has developed a dome-shaped gunnery trainer that simulates most actual combat conditions to be met in aerial warfare.

Dummy guns, mounted and weighted as .50-caliber machine guns, fire bursts of "light rays" at planes projected on a dome-shaped movie screen forty feet in diameter. Hits, bursts and rounds fired are recorded on electrical counters visible to the instructor. A bell rings in the students' earphones when his point of aim is on the nose.



A student (above) sights through the reflector sight of the Sperry upper turret. The aim-light projector is to be seen at the left of the sight. Note .50-caliber gun sleeves.

The unit is known as the Waller gunnery trainer for its inventor who also constructed the inner workings of the perisphere at the New York World's Fair.

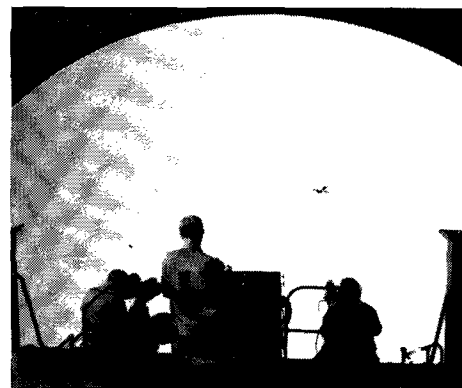
Although intricate in design and construction, the trainer's operation is almost

as realistic as actual aerial combat. Five 35 mm film projectors with sound tracks throw a composite picture of attacking combat planes on the screen. The sound tracks lend realism as the gunner hears the chatter of gunfire when he depresses the gun triggers.

Spots of colored light reveal where the guns are being aimed, photo-electric circuits control the angle of the "burst" and compensate for the lag from the time the gunner squeezes the trigger until the shells reach the target. Vibrators simulate actual conditions in firing.

Earphones keep the instructor constantly in contact with his four trainees, enabling him to coach them in their firing. When he wants to point out an error or illustrate a new point, he can freeze all action, stopping film, sound and firing but leaving the images clearly projected on the screen.

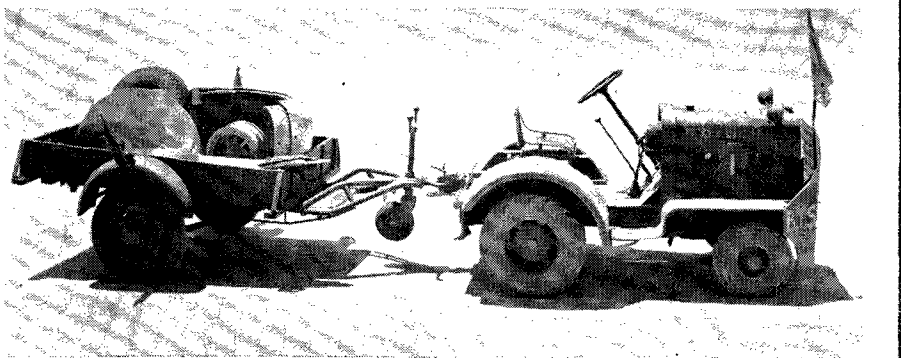
Power turrets are installed in two of the four gun positions.

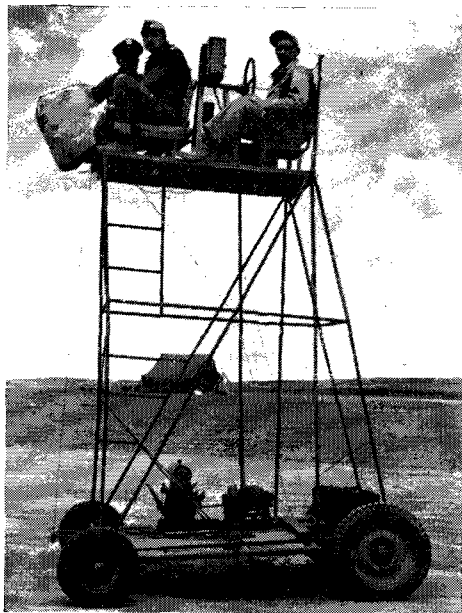


This photo of the Waller gunnery trainer taken toward the spherical screen shows an instructor at the console and two upper gunners. An attacking plane appears on the screen. The circles superimposed on the plane show the correct position of the gunsight at that instant of the attack. In training, these aim circles appear intermittently to instruct the gunner in the correct point of aim. When the attacking plane appears on screen without the aim circles the gunners fire and their score is recorded.

### Trailer Made from Standard Prop Dolly

This trailer, used by all squadrons at Roswell (N. Mex.) Army Air Field for hauling supplies to the line, was modified from a standard propeller dolly by moving the wheels forward to place them in the center of the trailer and replacing prongs and box with a wooden bed. Racks for two-bladed propellers may be installed over the wheels. — Maj. John S. Loomis, CO, 91st Sub-Depot.





The improvised bombardier trainer (above) made from salvaged materials by a B-26 squadron in North Africa. The "inventors" of the contraption are (left to right) Lieutenant G. K. Rhodes, Captain Joseph F. Perrin and Tech. Sgt. Herbert W. Eckhardt.

## Training During Combat

A Rube-Goldberg contraption, composed of discarded gas pipe, a wheezy putt-putt, two twelve-volt batteries, a plumb line, an intervalometer from a B-26, a steering wheel from a five-ton truck, wheels, axles and assorted parts from wrecked jeeps, trailers and salvage dumps all over North Africa, has made an efficient bombardier trainer for a B-26 squadron in North Africa.

Like other bombing squadrons assigned to overseas duty, this unit discovered that while its pilots and navigators had been given plenty of practice ferrying their planes across, the bombardiers had become rusty on the operation of their bombsights.

Capt. Joseph F. Perrin, squadron bombardier, decided to tackle the problem. A makeshift practice device rigged on the back of an ordnance truck sufficed for awhile, but practice was continually interrupted when the truck was utilized for its prescribed purposes.

So to rig up the animated gas pipe giraffe shown in the accompanying photo-

graph, Captain Perrin enlisted the aid of Lieut. G. K. Rhodes and Tech. Sgt. Herbert W. Eckhardt and they scoured the countryside for parts.

The seats came off a wrecked weapons carrier and the intervalometer from a B-26 that just managed to limp home from a mission over Tunisia. Two wheels and a platform were salvaged from a smashed trailer. A wrecked jeep supplied the other two wheels and an axle. The steering wheel with which the pilot "flies on course" came from a five-ton truck.

Most of the actual construction work was handled by Sergeant Eckhardt. In addition, he haunted the communications department until he was given the batteries needed for instrument impulse.

As a result of practice on this trainer the combat efficiency of the squadron was raised considerably, and the group CO ordered all bombardiers to take a certain number of hours a month on the trainer. Pilots, too, were ordered to practice on the contraption. — Lieut. William Cook, Northwest African Strategic Air Force.

## Transparent Celestial Sphere

From two defective astro-domes, Lieut. Col. J. E. Davis, Wright Field, made this simple celestial sphere to facilitate study of navigational stars.

By looking through the transparent sphere, stars appear in the same relative positions as they do when looking skyward from the ground. Normal celestial spheres show the stars in reverse—as they would appear if you were in a position outside the universe.

After cementing the two navigational



domes together, Colonel Davis cut in the latitude and longitude lines and drilled holes in the exact position of the stars in rough magnitudes. A fluorescent material was then sealed into the holes. In a dark room the stars glow and appear to twinkle. Allegorical figures were etched on the constellations for purposes of instruction.

## Tie-down System

A tie-down device using a chain and boomer has been in effective use at Pecos (Texas) Army Air Field, basic flying school, for several months. It consists of two rings set in concrete through which a chain with a hook at both ends is passed. After attaching the hooks to the towing rings of the aircraft, the slack is taken up by throwing the boomer which locks automatically. A ring is also set in concrete to correspond with the tie-down ring of the plane's tail section. A one-half inch rope through both rings serves this purpose.

During severe windstorms the device proved its merit as a safety system. Pressure in the tires tends to relieve strain and makes these tie-downs flexible from three-fourths to one and one-fourth inches.

The device was introduced by Col. Harry C. Wischart, commandant of the field, and designed by post engineers under the supervision of Maj. Harry L. Stebbins. — PRO, WFTC.

## Always in Place

A refinement has been worked out on the standard portable engine hoist at the 59th Sub-Depot, Lowry Field, Colo., to give ready access to the crossbar, which connects the lower ends of the front legs, and to have it always available.

The crossbar is connected permanently to the vertical leg by a chain on a piece of cable. — Lieut. Col. R. S. Smilie, CO, 59th Sub-Depot.

## New Bearing Packer

A wheel bearing packer, an easily operated device constructed entirely of spare parts, is the invention of Tech. Sgt. Jack Baity (below) 326th Basic Flying Training Squadron, Minter Field, Calif. The principal feature of the device consists of a cup fitted on a grease gun which is set on a base. The bearing is placed in the cup and a handle pressed down forcing the new grease upward and removing the old lubricant and cleaning solvent.

The packer which will grease all sizes of bearings, represents a saving of one-third on lubricating compounds, as well as a considerable amount of time. — PRO, WFTC. ☆



**A MONTHLY RECORD OF DECORATIONS AWARDED  
TO PERSONNEL OF THE ARMY AIR FORCES**

# Roll of Honor

## MEDAL OF HONOR

**COLONELS:** Leon William Johnson, John Roger Kane (Also Silver Star and Distinguished Flying Cross).

## DISTINGUISHED SERVICE CROSS

**BRIGADIER GENERAL** Frank A. Armstrong. **MAJOR** Thomas J. Classen. **CAPTAINS:** Gerald J. Crosson (Also Distinguished Flying Cross), Cecil C. Duncan (Also Distinguished Flying Cross and nine Oak Leaf Clusters to Air Medal), Frederick F. Wesche, 3d (Also Silver Star, Distinguished Flying Cross and Air Medal). **LIEUTENANTS:** Robert J. Dorwart, Murray J. Shubin. **STAFF SERGEANT** John R. Roller.

## DISTINGUISHED SERVICE MEDAL

**MAJOR GENERAL** James H. Doolittle. **BRIGADIER GENERAL** Orvil A. Anderson. **COLONELS:** Charles B. B. Bubh, Benjamin S. Kelsey, Paul H. Prentiss, Walter S. Smith\*.

## OAK LEAF CLUSTER TO DISTINGUISHED SERVICE MEDAL

**LIEUTENANT GENERAL** Frank M. Andrews\*. **BRIGADIER GENERAL** Uzal G. Ent.

## LEGION OF MERIT

**MAJOR GENERAL** Ira C. Eaker. **BRIGADIER GENERALS:** Francis M. Brady, Howard A. Craig, Asa N. Duncan, Haywood S. Hansell, Jr., Laurence S. Kuter, Paul L. Williams. **MAJOR** Jerome W. Jackson. **MASTER SERGEANTS:** John S. Eubanks, Howard F. Nutting, Edmund G. Robinson, Carl H. Russell, Steve Taylor. **TECHNICAL SERGEANTS:** Everett K. Bloomfield, Kenmore K. Cover, Alexander Erosky, Henry P. Mac Neill, Woodrow E. O'Brien. **STAFF SERGEANTS:** James P. McGloin, Arthur L. Olson, Arthur C. Robinson. **SERGEANTS:** Kenneth E. Atwell, Joseph Cibella, Fred S. Crane, Louis Criscuolo, William H. Davey, Harold J. Day.

## SILVER STAR

**BRIGADIER GENERAL** Joseph H. Atkinson (Also Air Medal with Oak Leaf Cluster). **COLONELS:** John C. Crosthwaite, Carlyle H. Ridenour, James H. Walsh. **LIEUTENANT COLONEL** Dale

D. Brannon (Also Distinguished Flying Cross). **MAJOR** Delwin B. Avery (Also Purple Heart, Distinguished Flying Cross and ten Oak Leaf Clusters to Air Medal). **CAPTAINS:** Blair M. Sorensen, George S. Welch (Also Distinguished Flying Cross and Air Medal). **LIEUTENANTS:** Stanley O. Andrews, Peter M. Childress, Eugene B. Davis, Allan P. Forsyth (Also Air Medal), Byron H. Gilmore, Lynwood M. Glazier, John F. Keith, Robert S. Miller, Donald Scullion, Harry R. Sengle. **MASTER SERGEANTS:** Francis A. Klaiber, Harry Urban. **TECHNICAL SERGEANT** Donald O. Martin. **STAFF SERGEANTS:** John C. Caputo, Dominick J. Genard, Robert T. Jungbluth, William H. Schiffer. **SERGEANTS:** Howard Cantor (Also Distinguished Flying Cross and Air Medal), William T. Gleason (Also Distinguished Flying Cross), Isaac Kaplan. **AVIATION CADET** Charles F. Buchholz.

## OAK LEAF CLUSTER TO SILVER STAR

**LIEUTENANT** William G. Bennett\* (Also Air Medal\*). **SERGEANT** William H. Nichols.

## PURPLE HEART

**LIEUTENANT COLONEL** Curtis Low. **MAJOR** Albert Zipser (Also Distinguished Flying Cross and Air Medal with eight Oak Leaf Clusters). **CAPTAIN** William H. Wemmer. **LIEUTENANTS:** John Jarvis Cape, Jr., William M. Carrithers, Jesse H. Elliott (Also Distinguished Flying Cross and Air Medal with three Oak Leaf Clusters), Jerome L. Foreman (Also Distinguished Flying Cross\*), Lawrence Greensides, John W. Norvell, Harold R. Taylor. **MASTER SERGEANT** Kenneth Lawton. **TECHNICAL SERGEANTS:** Ray Armstrong (Also Air Medal with three Oak Leaf Clusters), David B. Hatch (Also Air Medal). **STAFF SERGEANTS:** Edward Denning, Lawrence E. Dennis. **CORPORAL** Robert G. Thomas. **PRIVATE FIRST CLASS:**

James J. Gleason\*, James I. Lewis\*, Thomas F. Philipsky\*. **PRIVATE:** Brooks J. Brubaker\*.

## DISTINGUISHED FLYING CROSS

**BRIGADIER GENERAL** James Pratt Hodges. **COLONELS:** Edward H. Alexander, Bernt Balchen, Neil B. Harding. **LIEUTENANT COLONELS:** John Cerny, Robert E. Condon, Felix M. Hardison (Also Air Medal), Boyd T. Hubbard, Jr., Andrew A. Meulenberg. **MAJORS:** Karl T. Barthelmess, Anthony Benvenuto\*, Owen F. Clarke, Edgar W. Hampton, Grant Mahony (Also Air Medal with Oak Leaf Cluster). **CAPTAINS:** John Andrews, William J. Casey (Also Air Medal with Oak Leaf Cluster), George H. Davidson, Jr. (Also Air Medal), Paul A. Dorney, Lee C. Holloway, Virgil Ingram, Jr.\*, James G. Kandaras (Also Oak Leaf Cluster to Air Medal), Andrew H. Price (With Oak Leaf Cluster), Richard Spotswood Smith (Also Air Medal), Clyde H. Webb, Jr.\* (Also Air Medal\*). **LIEUTENANTS:** Sylvan Feld, Durward W. Fesmire (Also Air Medal), Charles F. Franklin, James W. Ingram, Edward M. Jaquet (With Oak Leaf Cluster), Vincent Puglisi (Also Air Medal with eleven Oak Leaf Clusters), Perry H. Penn, Isaac W. Smith, Edward T. Solomon, Coleman Stripling (Also Air Medal). **MASTER SERGEANT** Eldon W. Audiss (Also Air Medal with three Oak Leaf Clusters). **TECHNICAL SERGEANTS:** Bud W. Cook, Darrell D. Loy. **STAFF SERGEANTS:** Wayman E. Curry, William E. Gustafson\*, Vernon F. Portman, William T. Surgeson (Also Air Medal). **SERGEANTS:** Joe C. Corley, Jr., Kenneth R. De Long (Also Air Medal with Oak Leaf Cluster), John B. Moor (Also Air Medal), Raymond M. Vail. **CORPORALS:** William S. Bates, Marvin D. Middleton, George H. Logan, Santino M. Scolari. **PRIVATE FIRST CLASS:** Lester C. Berryman, Joseph T. McIlvain, Lawrence E. Raley. **PRIVATE** Ralph R. Simons. **AVIATION CADET** James K. Connolly (Also Air Medal).

\* Posthumous

## SOLDIER'S MEDAL

**LIEUTENANT COLONEL** Jeremiah A. Chase. **MAJOR** Mark E. Conan. **CAPTAINS:** Charles Stone, Harold L. Strong, John C. Wagner. **LIEUTENANTS:** Charles W. Byrd, James Congleton, Jr., Robert D. Lauer. **MASTER SERGEANTS:** Eigel W. Christensen, Dellyous C. Taylor. **TECHNICAL SERGEANTS:** Val Julius Boisdore, James H. Kingsley. **STAFF SERGEANTS:** Robert L. Capel, Albert A. Cattadoris, Carl T. De Angelo, George H. Slempe, Don T. Tetley. **SERGEANTS:** Harold E. Hawkins, William A. Stone. **CORPORALS:** Joseph A. Czajkowski, Morris Mesnik. **PRIVATE** Thomas H. Capel. **AVIATION CADET** Joseph Silva.

## AIR MEDAL

**MAJOR GENERAL** Lewis Brereton. **COLONELS:** Lawrence G. Fritz, Robert M. Love, Lauris Norstad, William R. Sweezy. **LIEUTENANT COLONEL** Samuel Charles Gurney. **MAJORS:** Dalene E. Bailey, Willard A. Fountain, Jacob W. Fredericks (With Oak Leaf Cluster), Otha B. Hardy, Jr., Payne Jennings, Jr., John J. Smith, Jr., Earl Raymond Tash. **CAPTAINS:** Homer E. Adams, Joe P. Baird, Richard P. Belden, Harold A. Bullock, Louis D. Chandler, Roderick G. Darelus, Robert J. Duval, Channing Burton Emberson, Richard F. Ginther, James J. Griffith, John F. Hampshire (With Oak Leaf Cluster\*), Melvin A. McKenzie, Horace B. McWhirter, Franklin A. Nichols, Henry A. Orban, John J. Owen, Jr., Delmar J. Rogers, William H. Smith, James F. Starkey, David B. Taggart, Lewis W. Tanner, Everett E. Tribbett (With Oak Leaf Cluster), John I. Turnbull, James Phillip Walker (With Oak Leaf Cluster). **LIEUTENANTS:** John H. Adams, Jr., William B. Adams, Jr. (With Oak Leaf

Cluster), Harold C. Brasher, Walter H. Brickett, William K. Britton, Lester W. Brock, Laverne D. Brockman, Addison L. Brown, Marvin H. Bryant, William H. Bryant, Bill Buckingham, George D. Burges, James R. Burgett, III, Donald J. Burkey, Charles D. Burpee, Jr., Claude S. Burnette, Jr., Titus M. Bush, Donald J. Calhoon, Henry S. Cantrell, Othen Nelson Carlos, Francis B. Carlson, George W. Caulkett, John H. Chalmers, Eldon A. Chappell, William R. Charnley, Hays H. Clemens, Donald V. Coakley, Oscar M. Coe, Jr., Irving T. Colburn (With Oak Leaf Cluster), James E. Compton, Ralph B. Conner, Paul F. Conroy, Robert L. Kleyla, Andrew Kundrat, Anthony L. Leal, James O. Levine, Stanley A. Long (With Oak Leaf Cluster), Harold C. McAuliff, Frederick L. Manthe, Harold E. Mitts, John Byrd Murphy, Harold W. Norton, Ashley S. Orr, Harry Owen Patteson, William W. Potter, Jr., John J. Pozorycki, Earl W. Quillman, John B. Roberts, Gerald Talbot Rogers, George A. Rush, William J. Ryan, Verl B. Schoenfeldt, Carl E. Schultz (With Oak Leaf Cluster), Henry H. Schwane, Chris J. Sheppard, Frederick B. Short (With two Oak Leaf Clusters), Richard J. Sierks, Jerome C. Simpson (With three Oak Leaf Clusters), Dorothy P. Shikoski, Edmund G. Smith, Herschel L. Smith, Wilfred L. Smith, Allen W. Snook, William G. Solomon, III, Clarence R. Stampley, Paul Stanch, Russell E. Stevens, Jr., Lucian H. Steyn, Wayne A. Stover, Malcolm Baker Sturgis, John C. Summers, Paul M. Thomas (With three Oak Leaf Clusters), Wilfred N. Turcotte, Harold J. Van Cott, Theodore J. Van Kirk, Ralph L. Vincent, Gordon F. Voght, Otto H. Wellensiek, Wallace D. White, Ralph B. Wildenhaus, Charles R. Wiley, John Sheffield Williamson, Jr., Richard A. Yorke, Louis

S. Zamperini. **TECHNICAL SERGEANTS:** William E. Abraham, Francis M. Counselman, Frank M. Ketron (With Oak Leaf Cluster), Joseph Markiewicz\*, Guy T. Padgett, Leonard A. Putnam, Harold R. Romer (With Oak Leaf Cluster), Robert H. Williams. Ned M. Woolsey. **STAFF SERGEANTS:** Stephen Gogolya, Merwin A. Griffiths, Clifton W. Groelz, Gervase C. Hollander, Glen E. Justice, Stephen S. Koslowski, Herman T. O. McLelland, James W. Mansfield, Stanley F. Marec, Augustine F. Mazzaccaro, Patsy Micacchione, James Morrissey (With Oak Leaf Cluster), Lawrence W. Nearman, Arthur E. Norgaard, Robert B. Norton, Burney Old Coyote, Jr., Clarence W. O'Neill, Theodore B. O'Shields, Carl E. Owen, David T. Owens, Herman S. Pacheco, Jr., James D. Pruitt, Jr., Norman A. Riggs, Douglas V. Radney, Thurman H. Russell, Harold A. Shaber, Chester F. Sheddlebower, Douglas M. Shutes, Carl H. Skinner, Frederick H. Sparks. **SERGEANTS:** John B. Byars, Leslie E. Cain, Thomas W. Crook, Jr., John H. Crowder, Ted R. Groce, George A. Mendel, Robert M. Moffitt, Carl E. Olson, Guy E. Parker, Philip A. Price, Gerard A. Pusch, Robert Spaulding, John P. Wilson. **AVIATION CADET** George A. Wangler.

## OAK LEAF CLUSTERS TO AIR MEDAL

**COLONEL** Bruce K. Holloway. **MAJOR** William A. Lanford. **CAPTAIN** Donald L. McKay (2nd). **LIEUTENANTS:** Arthur Eugene Aenckbacker (3rd), William J. Anderson (2nd), John R. Bannon (3rd), Junior M. Barney, Frank R. Beadle (2nd), Clarence L. Harmon. **SERGEANTS:** James M. Abbott (3rd), Elmer O. Almy, Abraham Todras (2nd). ☆



A/C Chas. F. Buchholz



Col. E. H. Alexander



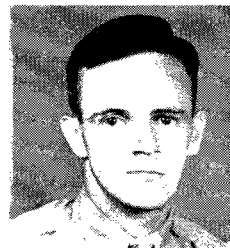
Lt. R. S. Miller



Lt. Perry H. Penn



Lt. Dorothy P. Shikoski



Col. James H. Walsh



Lt. Charles W. Byrd



Lt. Isaac W. Smith



Major E. W. Hampton



Lt. Col. Curtis Low



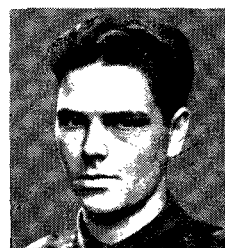
Lt. James W. Ingram



Lt. John W. Norvell



Lt. Allan P. Forsyth



Major Grant Mahony



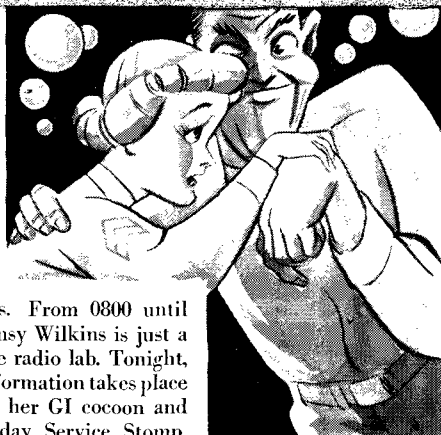
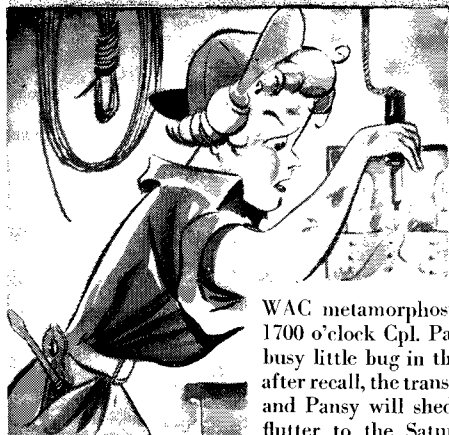
Sgt. Howard Cantor



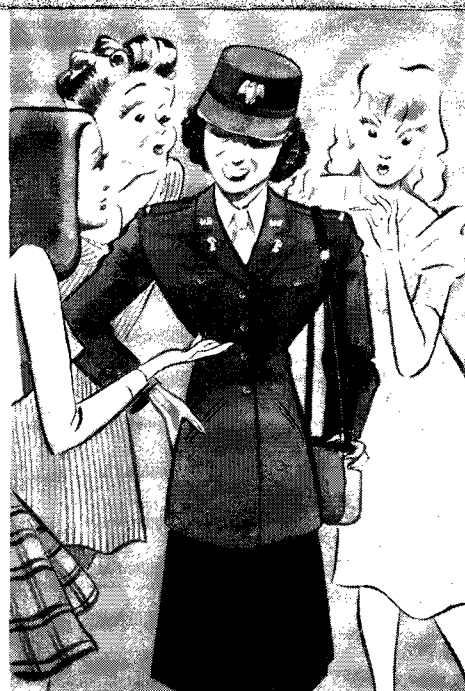
# WOMEN'S ARMY CORPS

By *Lieut. Wm. F. Lent*

US



WAC metamorphosis. From 0800 until 1700 o'clock Cpl. Pansy Wilkins is just a busy little bug in the radio lab. Tonight, after recall, the transformation takes place and Pansy will shed her GI cocoon and flutter to the Saturday Service Stomp.



Lieutenant Sanders got her long-awaited furlough and here she is back in the old home town, unconsciously doing a grand job of recruiting. With all the eligible men in the service these days, the Lieutenant will probably find herself reporting back to the field two days before her time is up.



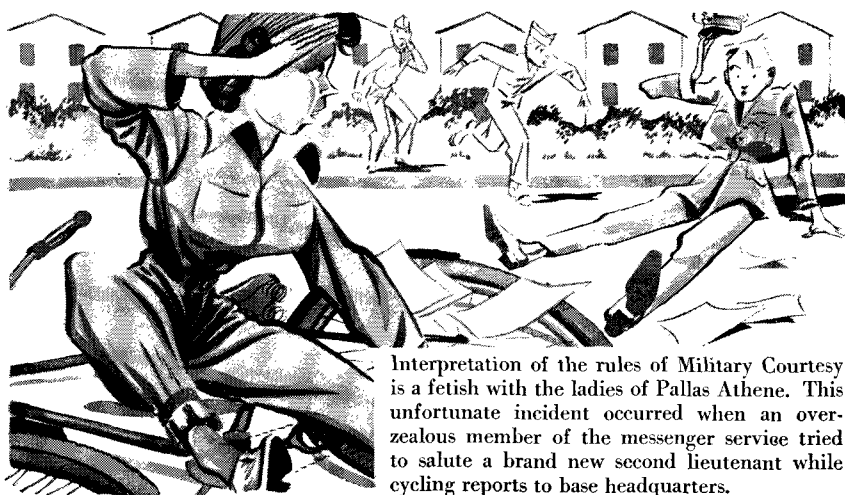
Brother, if you don't think the girls have some sharp drill teams, you're badly mistaken. Sergeant Johnson once led the chorus line at Radio City and now she pours precision close-order to her company with all the old showmanship.



One of the most popular gals at open-house affairs is Sergeant Bridget, the company cook. WAC messes have earned a reputation of which male mess sergeants may be justifiably envious. While the rest of the men guests whet their appetites, Sergeant O'Malley looks for a professional error in Bridget's construction of ice box chocolate pie.



Private Peters, ex-society deb, nurses a pair of tired tootsies (as yet uncalledoused to the 30-inch step in service slippers) while her roommate struggles to take the bends out of her 8.2 cast-iron skirt.



Interpretation of the rules of Military Courtesy is a fetish with the ladies of Pallas Athene. This unfortunate incident occurred when an over-zealous member of the messenger service tried to salute a brand new second lieutenant while cycling reports to base headquarters.



# Notes on the AIRCRAFT WARNING SERVICE

## MEMO FOR RECOGNITION STUDENTS.

There is a difference in the terms "recognition" and "identification" of aircraft. When a plane is reported and plotted on filter boards it is known as a "target." This target must be *identified* as friendly or enemy. When aircraft is sighted by pilots or observers it is *recognized* as a particular type of aircraft, such as B-24, P-47, etc. Identification determines aircraft as friendly or enemy; recognition determines the types.

**GOC AND AWC.** Two volunteer corps, each accorded official recognition by the Army, now serve the Army Air Forces in the Aircraft Warning Service in this country: the Ground Observer Corps and the newly designated Aircraft Warning Corps, whose members include filterers, plotters, tellers and supervisors who work for the fighter commands of the AAF.

**NOT JUST PLANES BUT STARS, TOO.** Members of the Ground Observer Corps in certain areas are assisting in the progress of scientific research in addition to their regular duties in behalf of the defense of the American mainland. In short, the Aurora Borealis is as eagerly looked for in certain localities as a Focke-Wulf, a Messerschmitt or a Dornier—and the anticipation is much more pleasant.

The National Geographic Society and Cornell University have asked the GOC to assist them in a research project concerning the Aurora Borealis, the purpose of which is to acquire data for the use of the armed forces in the field of radio communications. They approached the GOC because nowhere else in this country is there such a far-reaching organization already set up and in a position to report Auroras over such a wide territory. Observers who pursue this venture into the realm of astronomy will deal directly with Cornell University. (From the 1st Fighter Command's "AWS Volunteer.") **'EYES ALOFT.'** On the west coast the 4th Fighter Command's network radio program, "Eyes Aloft" recently cele-

brated its first anniversary on the air. The half-hour show, dramatizing the activities of the Aircraft Warning Service and the 4th Fighter Command, is written and produced by Robert L. Redd and is heard over Pacific Coast NBC Monday evenings at 1830 PWT. Redd, who originated the show and Sam Hayes, veteran radio announcer and commentator, volunteer their time to the AWS for this job.

When the problem of recruiting new volunteers in the Aircraft Warning Corps became acute, Hayes used his vacation to fly up and down the west coast on a busman's holiday, speaking before crowds on the subject of the AWS and its importance in the war. He contributed his time and services to the Air Forces for this venture, and charged only for the vast quantities of aspirin he had to consume on his 14-day jaunt. He visited 14 different cities, made 72 broadcast appeals, 102 personal appearances and recruited more than 3,000 new filter workers.

**COSTUME JEWELRY.** More than two tons of the costume jewelry collected by the volunteers of the Los Angeles Fighter Wing have been sent overseas to be used by AAF men in bartering with the natives. Pilots returning from Pacific zones tell of the aid a few pieces of this jewelry bring from the natives when flyers are forced down on a remote island.

**GO AWAY.** The usual down-to-business tension in AWS filter centers in the 1st Fighter Command, is relieved now and then by an incident worth a real chuckle. Recently a new volunteer in the Richmond, Va., center became flustered by the number of reports coming in to her position on the board. Instead of the orthodox, "Army, go ahead, please," the observer at the other end of the wire heard the plea, "Army, go *away*, please."

**A NEW CONVERT.** Among the Army's most resourceful men are the sector sergeants assigned to the AAF's Ground Observer Corps. They have to be, for not

infrequently they run into snags that call for all the ingenuity they can muster. We have just heard about one such instance. A tale that is going the rounds of the 4th Fighter Command.

It seems that a particularly conscientious sector sergeant in the Los Angeles Fighter Wing thought it would be a fine, educational, morale-building idea for the ground observers to visit the Army's filter and information centers and actually see the complex operations that are set into motion by the observers' telephoned reports of aircraft seen or heard. Accordingly, he arranged to pick up in a GI carryall a certain number of volunteer observers from posts in his particular area every Monday night, take them first to the "Eyes Aloft" broadcast and then over to the Los Angeles Information Center.

Everything went smoothly for the first couple of weeks. Then one night an MP officer happened to be walking along Sunset Boulevard in Hollywood at the exact instant the sergeant drew up in front of the NBC studios to deposit his charges on the sidewalk—as many as could conceivably be squeezed into the carryall. The relations between a sector sergeant and his volunteer observers are, to speak conservatively, informal at best and on this particular evening the whole *mise-en-scène* was anything but military. The volunteers, most of them women, were clearly having a wonderful time. They called the sergeant by his first name, they assumed a definitely proprietary air toward the vehicle itself, and they shouted and screamed with glee as they all piled out of the machine.

The officer was brought up short by this slap-happy scene.

"Sergeant!" he shouted, "Don't you know it's a serious violation of the regulations to carry civilians in a government vehicle?"

"Yes sir," confessed the unhappy sergeant.

"Then I shall have to order your arrest."

"But, you see, sir," the sergeant protested, "these people are not civilians, they are *ground observers*."

The story has a true Hollywood ending. The captain, who turned out to be the Provost Marshal for a large AAF station nearby, followed the crowd into the studio, became fascinated with a phase of the Army hitherto unknown to him, asked to accompany the group on a cook's tour of the I. C. and later drove back with them to inspect their posts—the first he had ever seen. Like everyone who first discovers the AWS, he "got religion" where it is concerned, and not only did he encourage the sergeant in his weekly enterprise and issue instructions to his MPs in the vicinity that cars bearing ground observers were not to be questioned in the future, but now, every Monday night he brings his own carload of volunteers to the "Eyes Aloft" broadcast. ☆

# Dead Planes

*By Capt. Robert V. Guelich*

**How our engineers give all articles of captured enemy equipment a third-degree examination—and what they learn.**



A captured ME-110 is given a onceover (top and left). Beneath the hood of the ME-109F (below) can be seen flame dampener exhaust stacks, prestone (large) and hydraulic (small) fuel tanks, 7.9 mm machine gun, and valves of the hydraulic system mounted on the fire wall.

# Can Talk

**I**N the early stages of the war, Germany captured much British and American-made equipment in France. Japan likewise captured wrecked American aircraft and other materiel in the Philippines. They had the first opportunity to learn that dead men can't talk but dead airplanes can and do. These early war losses contributed greatly to the enemy's knowledge of many of our aircraft secrets.

Since those days of Axis offensives, hundreds of Jap, Italian and German planes have been captured by the United Nations. We now are gathering captured enemy aircraft parts from all war theatres, assembling and testing equipment to learn what progress the enemy is making in aircraft design and development.

Because no one group of engineers is able to dream up all of the best aircraft developments all of the time, AAF engineers examine the most recent equipment being used by the enemy—searching for design and construction details that might be applicable to our own warplanes. From

reports on these tests, technicians of the Materiel Command's engineering laboratories keep up-to-date charts of the progress of enemy aircraft development.

Commenting on the results of these continuing studies, Lieut. Col. John M. Hayward, chief of the technical data laboratory at Wright Field, states: "From thorough analysis of enemy equipment, we have learned that American equipment basically is superior to that of the enemy. Nevertheless, we do not claim an absolute monopoly on all of the best ideas. Our job is to recognize and use ingenuity and engineering ability of the enemy, weighing the benefits of engineering compromises in order to take advantage of the best available ideas."

Since a story of the "bests" in all types of aircraft might read like a propaganda release—because of general superiority of American and Allied equipment—this article is intended to be a frank appraisal of German, Jap and Italian equipment with particular emphasis on that enemy

equipment which is relatively new or which compares favorably with that being used by the AAF.

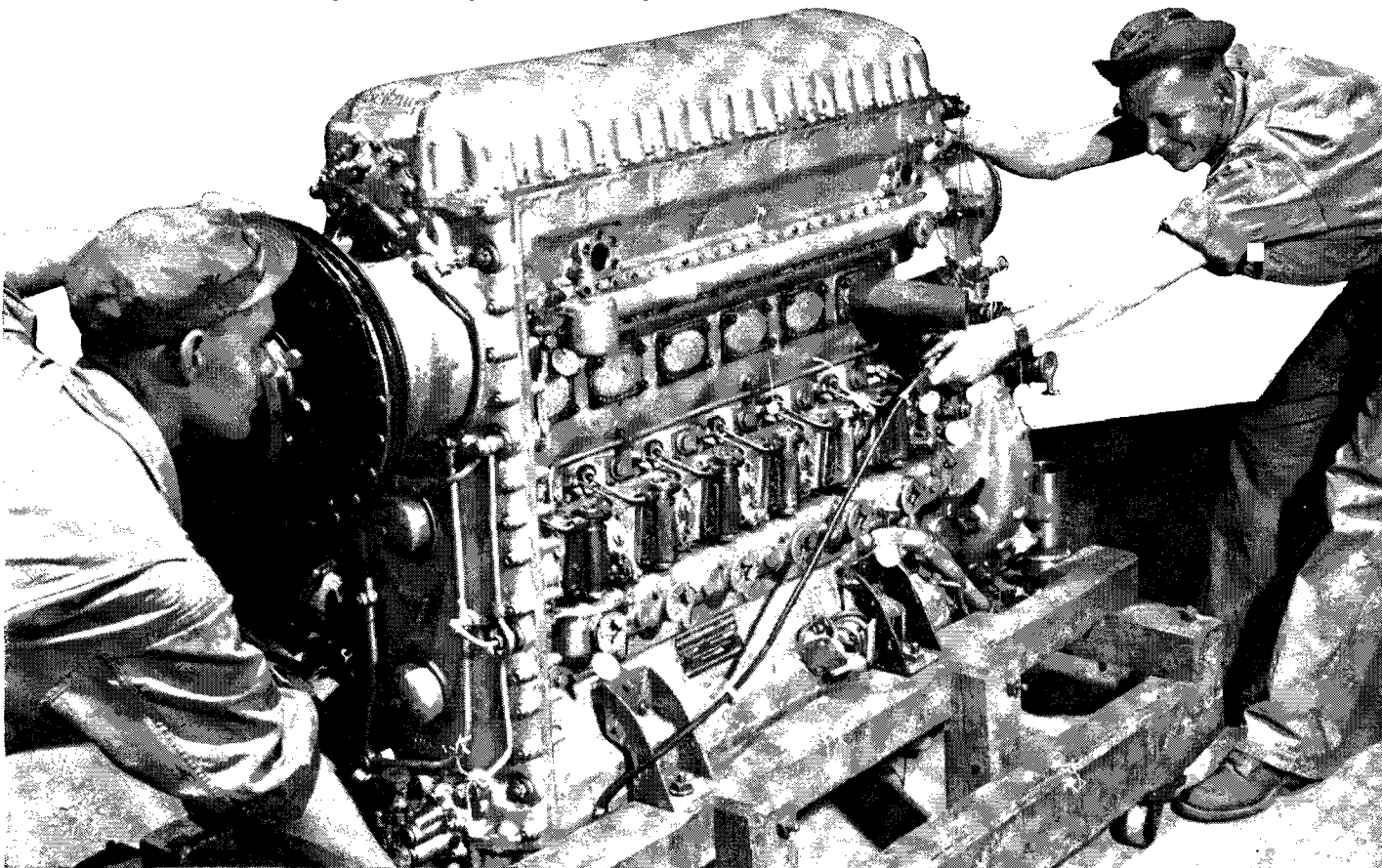
Here are some typical examples. When a German device was found to facilitate detachment of the propeller spinner for repair, it immediately was adapted for test on American-built spinners. German air filters have contributed to development of American filters. Despite the general inferiority of Jap equipment, one refinement discovered on a Jap automatic pilot has been applied to new American types. A Jap one-hitch parachute harness clamp also is being adapted for testing and possible use by the AAF.

Some of the devices incorporated in enemy aircraft are very clever, even though they may lack practicability in warplanes. Outstanding in this classification is a Rube Goldberg instrument panel found in an Italian plane.

**U**TILIZING mirrors, prisms and lenses, the readings of the flight instruments are projected on a ground-glass screen which enables concentration of five instrument dials in a rectangle approximating 3 inches by 6 inches. Although not new in principle, this type of panel is impractical for a warplane because all of the projection equipment is extra weight and because our present instrument panels have been standardized and have proved satis-

**This Jumo 205 German diesel engine is being taken into a test chamber at Wright Field. The engine is rated at about 600 hp and is used in some of the remaining JU-52 transports and in many of**

**the Dornier flying boats, where they are installed back-to-back for tractor and pusher props. It is a six-cylinder power plant with vertical opposed two-stroke pistons and compression ignition.**



factory. Instruments concentrated on the screen in the Italian plane are the compass, air speed, climb, bank and turn indicators.

Chrome plating and white enamel decorate the panel. (A flair for decorative touches is prevalent in most Italian equipment.) In another plane, the guns have chromium plated handle grips.

In comparing American instruments with those of the enemy, it has been discovered that Japanese instruments usually are lighter in weight than those in AAF planes although their performance is not comparable to American instruments under temperature, pressure and other variables. Nevertheless, some Jap copies have been found to be almost exact duplicates of American equipment.

Conclusion of one report on Jap flight instruments reads:

1. The . . . . instruments have no new design features.
2. Jap instruments are much inferior to present American instruments in regard to performance.
3. In general, Jap instruments are about the same quality as those used in this country ten to fifteen years ago.

None of the more recent American refinements have been found on Jap in-

struments and very few have been discovered on German instruments, which, however, are of a more original design.

Plastic cases are being used by all countries to house instruments, except when metal sheeting is desirable on electrical instruments. The Japs have been using all types of metal, aluminum, brass, steel—apparently whatever was available at the time of manufacture.

To facilitate maintenance and repair, some German instruments have carried schematic wiring diagrams on the outside of the case, another instance of German attention to the problems of maintenance.

Propeller development has been a field for many innovations in Germany. The Nazis seem to enjoy developing complicated pitch change devices such as that of the Argus propeller.

**I**N this propeller, which is made of laminated wood, pitch change is accomplished mechanically by the wind striking the fins of a windmill type of spinner. As the air speed increases, the rotatable spinner derives more resistance from the air and thereby increases the pitch. This propeller, only observed on 450 horsepower engines, appears to work satisfac-

torily on such engines. The Germans use no hollow steel propellers. Most are made of laminated wood, the rest of dural. The wood props have a cellulose acetate covering with brass or copper on the leading edge to protect the blade from chipping.

German propeller accessories are very good, being particularly designed for easy maintenance. Japanese propellers are mostly of a high quality dural and are almost exact duplicates of our older Hamilton-Standard props.

In the field of armament, the Germans are using very good guns and both Germans and Japs are using good ammunition.

The Mauser MG-151 20 mm cannon is one of the outstanding 20 mm aircraft cannons used in this war. It fires 800 to 900 rounds per minute—faster than similar guns originally installed in American warplanes.

Although the Japs and Germans are beginning to use 13 mm guns, they apparently continue to lag in development. Our .50 caliber machine guns are far better than the .30 calibers still used by the Axis nations. One of the only .50 caliber range guns in use by the Axis is an Italian Breda 12.7 mm. This appears to be a scaled-up

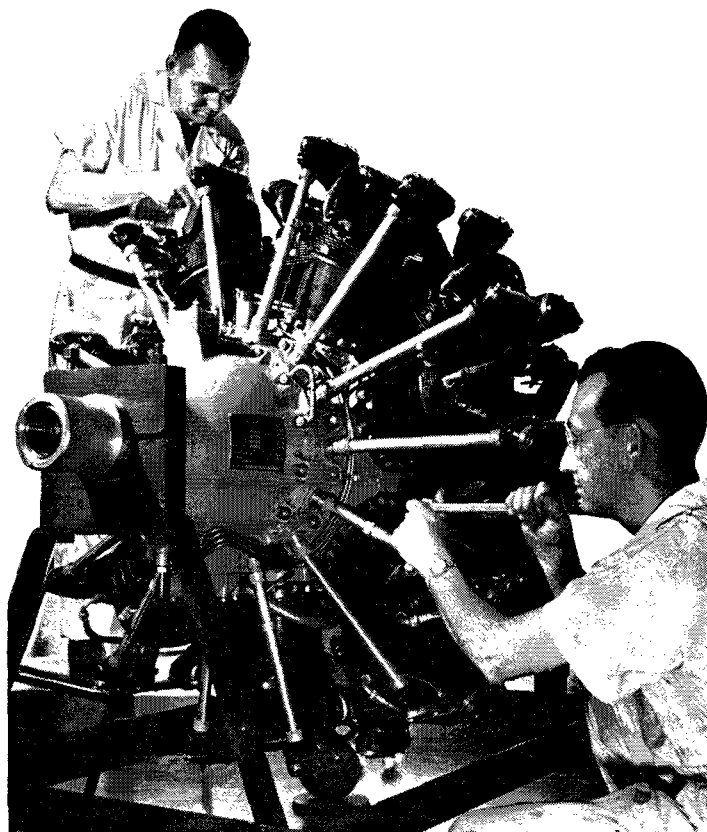
**Firepower of enemy guns is tested at Wright Field. Weapons shown here include (left to right) Italian Breda 8 mm flexible machine gun (held by sergeant), Breda 12.7 mm (flexible), Breda 7.7 mm (flexible), German 7.9 mm (flexible), another Breda 7.7 mm, German Oerlikon 20 mm fixed cannon, Oerlikon 20 mm flexible cannon, two German MG-17 7.9 mm fixed machine guns, Jap 7.9 flexible machine gun and an AAF .50 caliber machine gun.**

**The pitch of these German Argus prop blades is controlled automatically by the ribbed rotatable spinner which reacts with changes in air speed. Wooden-bladed, the prop is used on low-power engines**





Brig. Gen. Victor H. Strahm (right) and Capt. Selby M. Frank inspect a German bombsight—a Lotfe 7C type (Carl Zeiss), weighing about sixty pounds. It is crudely constructed, compared to the Norden, and the quality of stabilization—by electrical dampers—is doubtful. The optics, however, are especially fine.



This is an 840 hp, two-row, 14-cylinder, radial air-cooled Italian Fiat engine. It has a geared supercharger and is used to power such planes as the Macchi 200 fighter, the Fiat G-50 fighter, the CR-42 biplane and RS-14 bomber-reconnaissance seaplane.

version of the Breda 7.9—a modified Vickers Mark I. It is a little more than a .30 caliber gun doubled in size with little redesign of the internal mechanisms. The powder capacity of the shell is about one-half that of the American .50.

The Oerlikon 20 mm, used by Japs and Germans, is fairly light in weight but is believed to have a slower muzzle velocity than comparable American guns. The Jap 7.7 mm gun is a copy of a British Vickers used in the last war.

Although not used in aircraft, it is interesting to observe that Italian and Japanese .25 to .30 caliber ammunition has been found using a hard wood projectile which appears to be effective at short range.

Turret development of the enemy appears to be far behind that of the United Nations. The Germans have sent some rather ineffective looking semi-turrets into action, some of which are operated by remote control. The Japs seem to be depending upon the Lewis and Vickers Model 3 flexible mounts.

Captured bombsights have been generally good but not comparable to our best. Of the German Type 7-C, built by Zeiss, the Materiel Command report reads, "This type bombsight contains nothing in nature of design which would be an

improvement to our system." A Jap Nikko bombsight from a Mitsubishi Type 96 Navy bomber shot down near Darwin was reported to be very similar to the French Bronzavia Devaud Type D-30 bombsight.

Enemy aircraft engines of all types have been captured and returned to Wright Field for careful analysis and rigid testing. They include such types as the German BMW-801, the DB-601, the Bramo Fafnir, the Jumo 211, the Italian Fiat, the Jap Kinsei 44 and many others of more recent manufacture.

**GENERAL** procedure is for an engine, such as the BMW-801A, to be torn down by power plant engineers. Specialists from American aircraft engine manufacturers then may be called in to examine the fuel injection system, all construction features of the engine—such as provisions for maintenance and repair—and every nut, bolt and gear that goes into the engine.

Upon learning whether or not there are any new features in the engine, it is reassembled and put on a dynamometer test stand to determine its power output. From this and subsequent analyses, reports are prepared and distributed to all interested parties to enable them to evalu-

ate progress of our enemies in designing and fabricating warplanes.

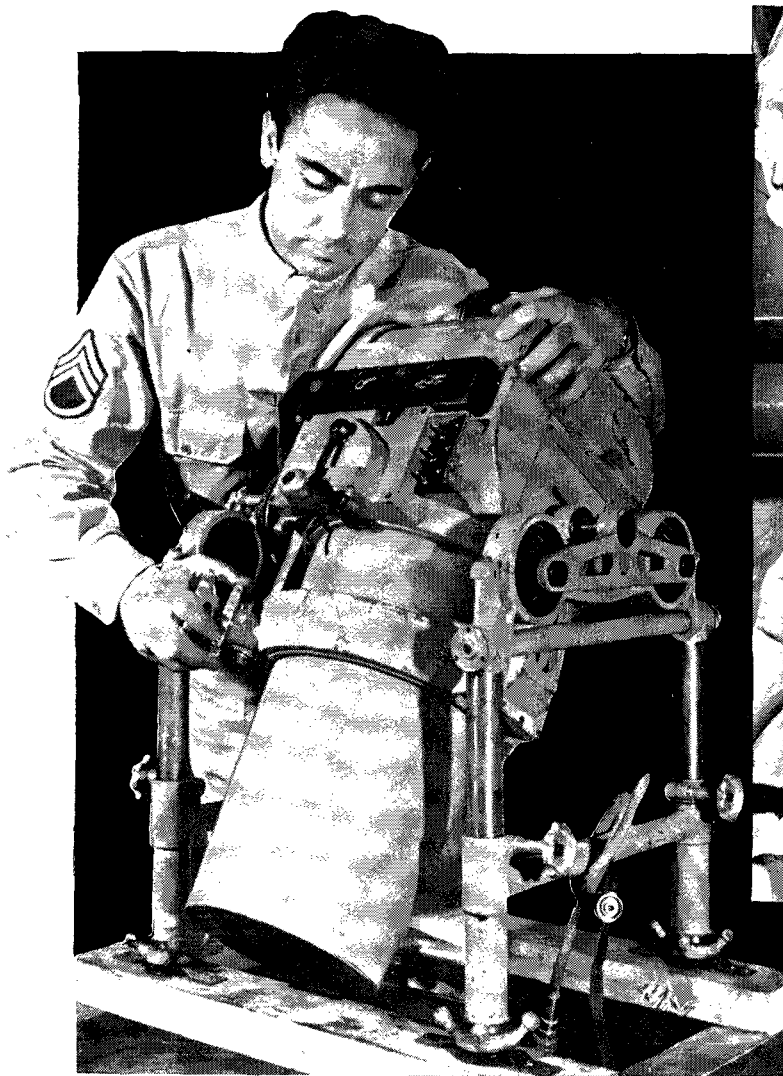
These laboratory examinations have proved that American equipment is generally superior to that of the enemy. In those few cases where an Axis-made engine reveals a new idea or a better type of material being used, our engineers are quick to improve AAF equipment.

When Wright Field received its first ME-109, six mechanics who knew nothing about German airplanes removed the engine completely in less than twenty minutes. Since that was far less time than is required for removal of American fighter engines, our engineers began to incorporate some of the German ideas in our new power plants. One of the major installations that facilitated rapid removal of the power plant was the concentration of all wiring and fuel connections into a small number of sockets.

From other ingenious methods used by the Germans in mounting their engines, AAF engineers have been able further to simplify engine installations in some U. S. planes, thus facilitating removal of the engine for overhaul and repairs.

The Jumo 207 diesel engine, used in the JU-86P medium bomber, is a tall, slim, in-line engine with opposed pistons that appear to be designed for use at very high altitudes. A bomber with this type of engine has been observed above 43,000 feet over England. (Continued)





**This aerial camera, similar to the American K-17, was taken from a captured German plane. It is believed to have been manufactured in Czecho-Slovakia. The German lenses are exceptionally fine.**

Another interesting German development is a blower fan on the 1600 hp BMW-801 radial engine. The fan, attached to the propeller hub, forces cool air through carefully designed channels around the cylinders. It revolves approximately two and one-half times as fast as does the propeller to provide efficient cooling on the ground, during climbs when speed is reduced, and at high altitudes. The new principle already has been tried out on an AAF medium bomber.

German engines usually are slightly heavier with an output (per unit displacement) less than that of our engines.

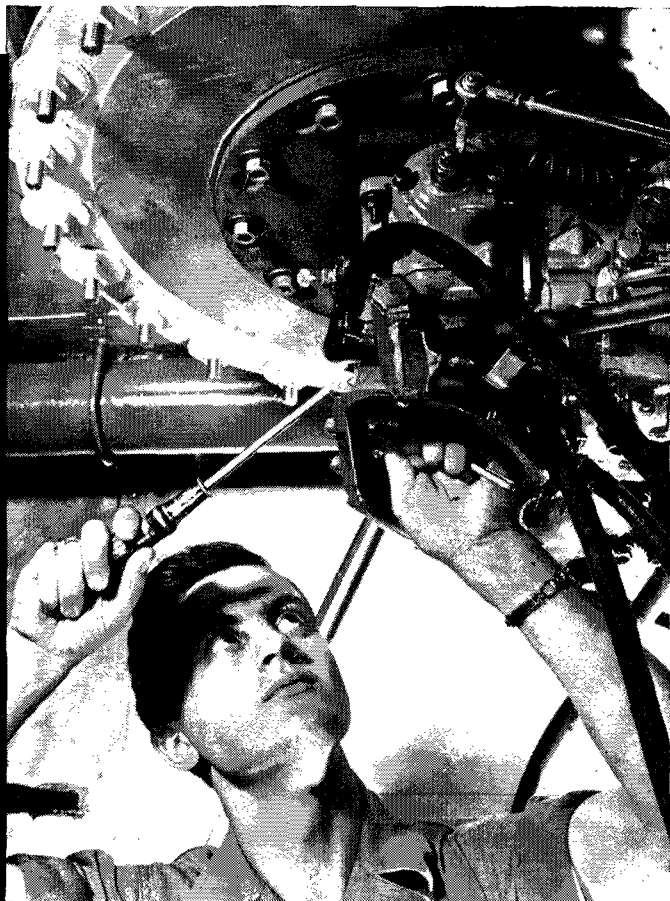
Japanese engines are little more than conglomerate copy of American, British and French engine designs. Pratt and Whitney engines appear to have been the models copied most extensively. Although the Japs have copied our engines, they are getting additional horsepower out of the same engines because they have built them to closer tolerances. However, these engines are copies of types no longer used in our combat aircraft.

The power plant laboratory of the Materiel Command also analyzes fuels and self-sealing fuel tanks.

Of an Italian self-sealing fuel tank, tested in February, the report reveals that two .30 caliber rifle shots caused the tank to leak a stream approximately one-sixteenth of an inch in diameter from both exits. One .50 caliber ball tore a hole approximately 1 inch by 2 inches which remained gaping, showing no sealing characteristics.

**FROM** some of the more recently shot-down Jap aircraft, sections of rubber and corrugated paper have been found fastened externally to fuel tanks as attempted protection of the most vulnerable parts. These sections are held in place by a wire frame. Tests of the material, however, show that the crude device does not meet American requirements.

German bullet-sealing tanks, on the other hand, are of very high grade materials and first-class workmanship. Tanks obtained from recently captured aircraft



**A Jap duplex carburetor is shown being installed in an "air box" at Wright Field for testing under flight conditions at a wide range of temperatures and altitudes. This carburetor, from an engine of about 1,200 hp, was found to be inferior to U. S. types in altitude and load compensation tests.**

are almost identical to those used in American planes.

A test of gasoline from a Jap plane that crash landed in New Guinea showed that it approximated a ninety octane fuel except that the gum and copper dish residue was relatively high.

In the aero-medical laboratory oxygen equipment from the Axis nations has been thoroughly tested with the findings that the German systems are the best of the Axis while American oxygen equipment proves more reliable and more efficient than any Axis-made mask or regulators. The lag in Axis development of good oxygen equipment is believed to be a retarding factor on their bid for high altitude equality with the Allies.

Japanese oxygen masks have been very crude, covering the mouth and nose like a small muzzle without any apparent attempt being made to obtain close fits into the various shapes of pilot faces. The German oxygen units are well made and provide much better fittings.

The constant oxygen supply system still is being used by the Japanese while both American and German systems are of the demand type.

With most other nations, Germany and

Japan are using high pressure oxygen cylinders. AAF systems, however, have been changed over to low pressure to reduce the danger of oxygen explosions when the cylinders are struck by shells or anti-aircraft fragments.

Radio equipment used by the Germans is far superior to that being used by the Japanese and compares favorably with that used by the Allies. Nazi equipment has an extensive range with excellent reception. The Jap radio units are made of poorer grade materials, resulting in lack of range and effectiveness. Many of the Jap ships shot down have not been equipped with any radio.

Photographic equipment of the Germans generally is larger than that being used by the AAF, although, through the extensive use of magnesium, the weight is approximately the same. Preliminary aerial photographic tests have indicated that the German film is slower than that we use.

German lenses, on the other hand, continue to be exceptionally fine. Accessory parts of the Nazi cameras are not of the same quality as those used by the AAF, although they appear to have been manufactured by methods not adaptable to mass production.

The Japanese cameras are carbon copies of the Fairchild K-10, which has not been purchased by the AAF for over ten years.

Clothing for air crews generally is of good materials and good workmanship in all countries. Poorest quality clothing is that used by the Italians. Japanese outfits are of good materials and workmanship but usually are not of the most efficient designs. Nazi flight apparel is of the best.

A Nazi electrically heated suit, as an example, is lined with a plush material and the outer material is of cotton twill. This is the coverall. The wired suit is a two-ply silk trico with sewed-in wires. Fourteen nickel-steel zippers enable the pilot to shed the suit easily.

The Jap-type electrically heated suit is made of a poorer quality material—both leather and lining—and uses a simple wiring system. A detailed diagram on the inside of the Jap pilot's clothing suitcase shows how repairs of the wiring may be made and this idea is being considered for adoption with American outfits.

The Jap electrically heated boots are warm but are very stiff and uncomfortable, being made of a cheap grade of leather.

FROM Wright Field's morgue of enemy equipment have come volumes of interesting reports about the Axis. For instance, Japanese parachutes have been received and examined, disproving the reports that no Jap pilots wear chutes.

The Germans evidently have been well-supplied with magnesium and aluminum throughout the war. On a two-engine JU-86 almost 600 pounds of magnesium

was used in this airplane. An unusual parachute dive-bomber brake on the tail of the DO-217 bomber has been studied to ascertain the advantage of this German invention.

The pilot's safety belt in the ME-109 was found to be more comfortable and easy to adjust even after wet through by rain.

German engineers have pioneered in the use of hot air for de-icing the leading edge of the wing. From a JU-88 bomber an entire wing section was thoroughly examined by Wright Field and by the California NACA laboratory. The heat exchanger around the exhaust manifold collects the heat, which is then piped through the leading edge of the wing to a point near the ailerons where it is exhausted.

Since examination of this wing section, hot air de-icing installations have been

made on practically every type of combat and cargo airplane of the AAF. Only recently Lockheed reported that hot air de-icing would be used for the wings of its second and third C-69 (Constellation type) planes.

From such examinations of captured enemy equipment by the laboratories of the engineering division of the Materiel Command has come a wealth of information about the enemy's ability to produce aircraft and equipment.

When Wright Field completes its investigation, the equipment is made available to aircraft manufacturers who are interested in enemy design and assembly methods, and to other aeronautical research laboratories in this country.

Every article of captured equipment is put through third degree examinations until the airplanes literally "squeal" to the men who are designing our warplanes. ☆

**This German pilot's suit is of two-ply silk trico fabric with interwoven electrical heating wires. Outer garment is a plush-lined cotton twill coverall with electrical connections for the gloves and shoes. It has fourteen zippers and they are of nickel-steel.**



*What's wrong  
with this picture?*



**VARIETY** is the spice of life. Accordingly, this month we coaxed our camera away from the nose of a plane and snapped this rear view of a P-47.

Mishandled repairs can occur on any part of an airplane as shown by these empennage fixers. There are six boners in this photo, listed on Page 56. Are there any we missed?

Topnotch mechs always bear in mind that the airplane not

only must fly, but also that it must fly *reliably*. To achieve this is a solemn responsibility **ON THE LINE**.

To show how it shouldn't be done this picture was posed by members of the Air Service Command's 315th Depot Repair Squadron, Patterson Field. They are Pfc. William Ramsey (left), Pfc. George Kirkendall and Pfc. Edward W. Kerscher (top).

# ON THE LINE

## HINTS ON HAND TOOLS . . .

Recall the old wheeze about throwing a monkey wrench into the works? That's just about the equivalent of using a Stilson wrench on surfaces that require an open end wrench. Stilson wrenches were designed primarily for the general purposes of plumbers—not aircraft mechanics—so take the time to get the right wrench out of the tool box and if it isn't there go to the stock room for it.

Which gets us around to the matter of using hand tools. Improper usage results in damage to parts as well as to the tools, and makes for slim chances of proper repair.

Choosing too large a lever to tighten ignition plugs can break them; use the torque wrench to get the right tightness. Tightening or loosening with too large a wrench will round the corners of a nut, making it difficult to remove the nut at all. This then means cutting it or forcing it off with a special device, necessitating replacement with a new nut. In similar maltreatment of a screw, using the incorrect screw driver will probably throw a burr on the edge of the slot.

There is one positive precaution to avert these needless troubles. And that is read the TO. For every airplane, for every service procedure, a TO has been carefully written. It tells what tool to use and where to use it.

## LOWDOWN ON WINTERIZATION . . .

Since a winterized airplane can operate anywhere, nomenclature can be misleading. Winterization is a term referring to the preparation of a plane or its equipment so that operation will be satisfactory within a temperature range of from 65 degrees below zero to plus 160 degrees Fahrenheit. Extreme temperatures naturally affect the operation of oil system, fuel system, power plant, controls and other important parts of the airplane, and it is necessary to guard against improper functioning. During the winter extremes of temperature present severe problems which make servicing more complicated than in summer months.

The first essential is to see that all parts are lubricated with oils and greases which are satisfactory at all temperatures encountered, and in accordance with current practices, winterized airplanes should operate satisfactorily in any theatre. That

is, present winterization processes make planes adaptable to any climate. However, certain exceptions require special equipment for extremely low temperatures, such as providing special snow and ice tires, form-fitting covers to keep ice off wings, de-icer boots for wings and tail surfaces and internal combustion type heaters to provide heat in passenger compartments of transport airplanes.

It is imperative that mechanics servicing airplanes destined for extremely low temperatures become thoroughly acquainted with the general requirements of TO 00-60-3. It describes in detail methods of cold weather ground warm-up, cold weather starting and stopping of airplane engines, and explains the problems facing mechanics servicing planes in the arctic.

## SAVED FROM THE BONEYARD . . .

As a result of the ingenuity and industry of its crew chief, Staff Sgt. Anthony



P. D'Andrea, an observation airplane forced down near an Antilles Air Command base and marked for the boneyard has been restored to flying status.

Crew Chief D'Andrea first trekked six days through swamps and dense foliage to reach the crash scene at a mud flat near Paramaribo, Surinam. With the aid of native labor, a short runway of chicken wire and scrap lumber was improvised and the plane jacked laboriously out of the mud. From this makeshift runway veteran jungle flyer Capt. Charles Ross volunteered to fly the plane out. He got it away and landed at a nearby airbase.

Back at its home base the craft was

## A monthly maintenance roundup prepared in collaboration with the Air Service Command and the Technical Inspection Division, Office of the Air Inspector.

grounded for a complete overhaul, and the only usable parts were the wings, instruments and metal struts of the fuselage. Sergeant D'Andrea then began his tedious task of rebuilding it. Using materials available at his South American jungle base, he completed a major depot overhaul job, virtually taking the plane apart and putting it together again with new parts.

A plane once given up for lost is now back in service, being used for reconnaissance flights, rescue work, aerial photography, short shuttle service and similar missions.

Hats off to another job well done by mechs of the Army Air Forces.

## DON'T SWING THAT THING . . .

Hoisting at an angle or not centering the crane above the object to be lifted tends to cause swinging of the piece being raised. This may result in damage to valuable equipment or injury to personnel, or both. First adjust your crane so that it is centered exactly before starting the hoist. Take a look at AC Circular 130-2.

## SPREADER BAR . . .

When an engine is left on a type A-2 frame, be sure to install a spreader bar. Failure to do so will result in bending the A frame at the fulcrum point and endangering personnel in the event of a collapse.

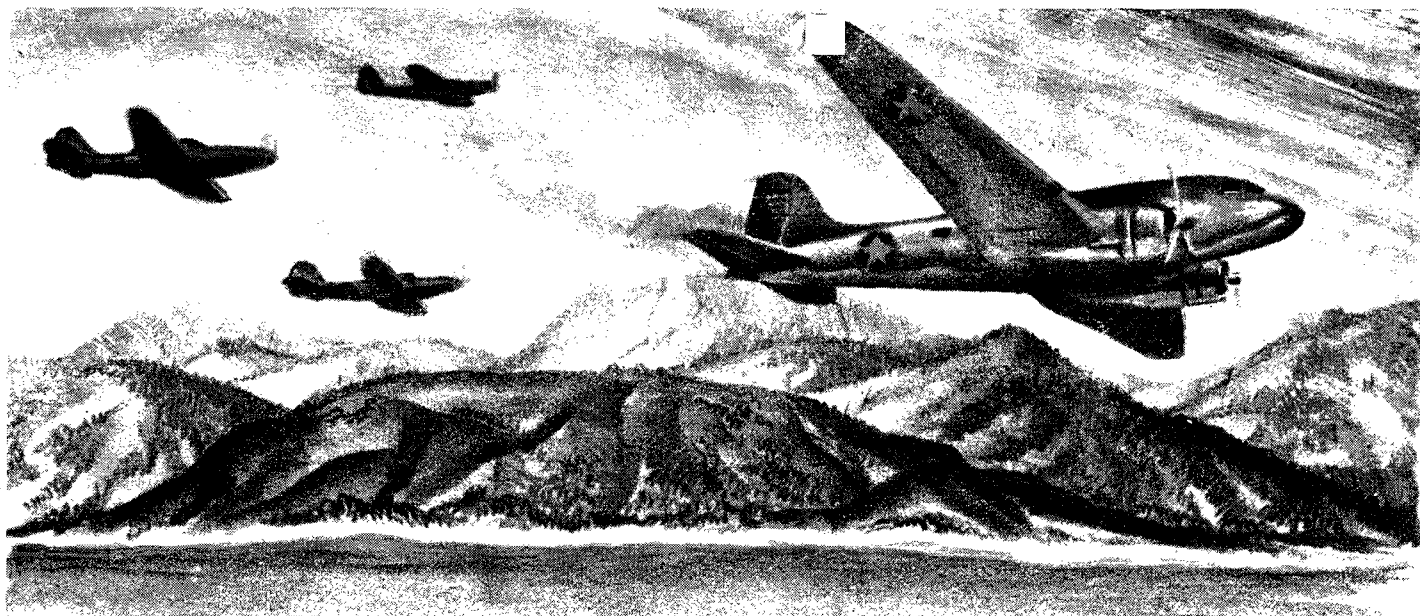
## IT WON'T HOLD YOU . . .

Cowling support frames are designed to keep the cowling in place and are not stressed to hold the weight of a mechanic. Keep this in mind the next time you're working on an engine, mechs.

## JACK SAFETY NUT . . .

Safety nuts are to be screwed down on airplane jacks when in use. See TO 19-1-18. ☆





# THE BANANA RUN

*By Sgt. James Winchester*

**AIR TRANSPORT COMMAND**

WE walk from the Brownsville operations office through the warm Texas night to a cargo-laden C-47.

Out of the shadows troop an assorted group of officers, enlisted men and civilians ready for the Brownsville-to-Panama hop. The pilots sometimes call it the "Banana Run."

Blue-striped foreign military cargo is stowed high along one side of the luxury-stripped cabin. Mail bags, carrying thousands of letters and packages to our men in the Caribbean area, fill the rest of the space, leaving only a narrow aisle, barely wide enough for the crew to squeeze through with their map cases, down the center.

The job ahead is just another day's work for pilots like Capt. Bill Betts. But looking at their job as a whole, it is an important cog, not only in supplying of cargo and mail to our vital Caribbean defense outposts but also in the training of newly graduated aviation cadets who, in a few brief weeks of concentrated training, are transformed into capable and efficient Air Transport Command pilots.

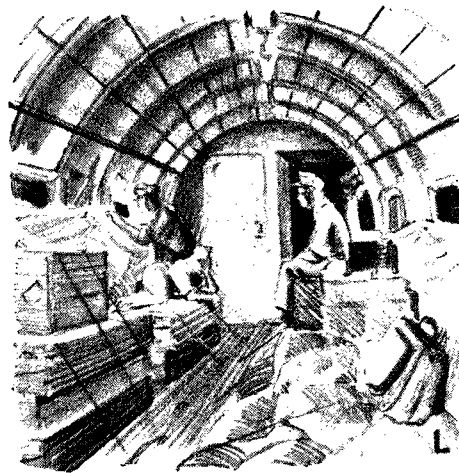
Coming down the aisle of the plane behind us, as we inch along between the cargo, is one of these transition students who is making his first run over the route as an observer. Later he will fly its 2,000-mile length on two round trips as co-pilot before leaving the transition school and going into an operational training unit for final polishing.

This one is Lieut. Richard Wagner, who is fairly typical of most of the boys coming into the command for their transport pilot training—young, aggressive and eager to do his part in what he thinks is the best possible way, flying the freight. Some guys like the fighters and some like the bombers, but for these boys there is something in the thought of a big cargo plane winging its way through the night across a black ocean that makes their pulse beat a little faster.

This Lieutenant Wagner, for instance. He had wanted to fly for a long time and had indicated he would like to be a transport pilot, so his future training was planned to lead him up to that goal. He went through the regular curricula of the aviation cadet program before he received his wings, but he'd never been in the cockpit of a twin-engine airplane until he arrived at Brownsville from the ATC's reception center. At Brownsville his training in the intricacies and problems of air transport flying really began.

For the first three weeks, he had large doses of work thrown at him from every angle. He spent hour after hour making landings and take-offs in a twin-engine C-47. Under the able guidance of a contract carrier pilot instructor he learned to know the instrument panel of the C-47 until he could shut his eyes and name the position of every dial on the board, how

ILLUSTRATED BY LIEUT. WILLIAM T. LENT



it worked and what it was used for. He learned that there is a lot of difference in flying a twin-engine transport and a single-engine trainer, and most important of all he learned that he hadn't yet started to learn all there was to flying.

In case Lieutenant Wagner or any of his fellow student pilots should ever be confronted with engine trouble aloft, a large portion of their transition training in Brownsville was devoted to practice and procedures in how to take care of such situations. Day after day they were taken up to practice flying with one engine cut out. They learned to feather the prop, trim the plane and do a score of other things necessary in operating on one engine. They learned the sounds of engines so well that they could recognize trouble almost before it happened.

They learned the importance of checking every single piece of safety equipment aboard a plane before takeoff. And the student pilots really appreciate this lesson when they look down from the safety of 10,000 feet into the mountains and jungles they fly over during the latter phase of their training and think



## ATC student pilots get their first taste of real transport flying on this Brownsville-to-Panama hop.

of the many things that might happen.

The trip south for Lieutenant Wagner is the beginning of the end of his training. Like most of these transition student pilots, he has never been out of the United States, and there will be plenty for him to see and observe on this trip south of the border—things that can't rightfully be called "training aids" under the strict interpretation of the military but that, nevertheless, are equally important in molding the new pilots.

Before leaving Brownsville, Lieutenant Wagner has been instructed in the rules of behavior for military personnel in the Central American area. Four rules stand out:

1. Don't exhibit firearms in public.



2. Don't whistle at girls in the street.
3. Obey all local civilian laws and ordinances.
4. Be properly uniformed at all times.

So several hours and some thousand miles later, when the wheels of his plane roll to a stop at the end of a runway hacked from the middle of a dense coastal jungle, he's ready to forget those months of tedious training back in the States—at least for 24 hours, until he picks up his bag and map case the next day to take the second leg of the flight on to Panama. They will stay overnight at a jungle field and fly back on the following day to this same airport, where they will lay over for another 24 hours before returning to Brownsville.

In all, four days are required for each crew to make the round trip from Brownsville to Panama, and it is the policy of allowing these 24-hour breaks in flying time that is largely credited with the enviable operation record that has been established over this route. Since its inception every scheduled flight has been completed and not a life or plane has been lost.

The "coke" bar, located in the operations office at this jungle airport, is one of the Army's smallest, yet busiest PXs. Its counter is less than seven feet long and its principal stock in trade is a huge refrigerator, but this PX does a monthly business of better than \$900 which comes mainly from these ATC pilots and the passengers on their planes, both north and southbound. Lieutenant Wagner is joined at the bar by three of his Brownsville buddies, also there for their 24-hour layover.

Like youths everywhere, in or out of uniform, get more than two of them together and they will go looking for a pretty ankle. Pretty ankles being scarce at this jungle airport, it is no effort at

all to make the decision to ride an Army truck up a mountain trail to spend the night in a cool cosmopolitan Central American city.

Truck travel in the jungle not being designed for passenger comfort (one pilot is reported to have made the rest of his observation flight standing up after completing this junket to the high country), a sergeant undertakes to relieve the monotony of the journey. His approach is direct and to the point. Three minutes from the field he begins to riffle a worn pack of cards with practiced fingers. Too rough to play cards on any flat surface, if there had been any flat surface, he proceeds to initiate the new lieutenants into the mysteries of a game known as "Esquintla Showdown" and taught him by a couple of native soldiers in a town by that name. It's a simple matter. You deal seven cards to each player, who holds them tightly in his hands so they won't be shaken loose when you hit a bump, which is on the average of three bumps to each complete revolution of the wheels. Aces, deuces, one-eyed jacks and the card that had a corner torn off in

some previous GI struggle are wild. Best five cards out of the mess collects a quarter each from each of the other players. You'd be surprised how it makes the time—and money—pass.

In the town, high in the mountains, even in the middle of summer two blanket at night are welcome. Here leather goods can be purchased for a fraction of their cost in the States and it's a rare pilot indeed on this run who doesn't have a pair of Guatemalan boots, a Guatemalan leather map case and a native belt. Here, too, pretty ankles are more common than in the jungle. But Lieutenant Wagner's best remembrance of the city is the sign over the slot machines in the local officer's club:

"In case of an air raid stand here; these machines have never been hit yet."

By ten o'clock the next morning, Lieutenant Wagner and the others are off from the jungle airport for the six-hour run down the long neck of Latin America to the Canal Zone. With one stop for refueling, this leg of the trip passes over some of the most beautiful country in the Americas—towering mountains, volcanic lakes and miles of sandy shore line.

As the transport approaches Panama, interceptors come up out of jungle airports to inspect the ship and from then on until the end of the trip crew and passengers alike are given a first-hand show of the care with which Uncle Sam guards his approaches to the Panama Canal.

The trip home is just a repetition of the run south, except that passengers are hauled instead of freight and mail—officers and soldiers returning home on furloughs, passes, transfers, most of them for the first time in two or three years. In fact one wag in the waiting room at the airport in Panama has penciled an arrow pointing to the loading door and underneath it written, "This way home!"

Back in Brownsville, Wagner sums up his impressions of this first run of many he will make all over the world in ATC planes.

"It's a wonderful experience," he comments, "not only because of the country and various types of weather you are able to observe and fly over, but also for the sobering and steadying influence you get from the thought that here a mistake doesn't just mean another hour of classroom study, more likely it will mean a couple of weeks hacking your way out of some jungle, fighting mosquitoes and snakes and tropical fevers. If I learn nothing else here that lesson itself will be forever valuable to me—an ounce of prevention on the ground is worth a pound of cure in the air."

In a few months he'll probably be as blasé about flying from Miami to India as he is about shaving himself in the morning but right now he is a pretty excited guy. ☆

# WHEN GREETING AN ESKIMO SAY,

# Eye-yigh!

THE Eskimo may seem enigmatic to us. For all his stolid appearance, he is keen about sports and merriment. He can be friendly and loyal, but he can also let a man freeze to death or starve if he doesn't like him. Friendliness and firmness are the two qualities you'll need to deal successfully with the Eskimo. Above all, even the smallest knowledge of the Eskimo language will work wonders in winning his friendship.

With the first word you speak, an Eskimo will size you up as an outsider. He won't expect you to understand a flow of language and will probably talk to you in single words and short phrases. But he will be complimented and inclined to friendliness if he hears you trying to speak his language. He may even grin broadly and shake hands enthusiastically. Be friendly in return.

The Eskimo language is difficult to learn. A white man can't hope to speak it well without living for years in the Arctic. It is, for the most part, a *spoken* language. The Eskimos have found it possible to carry on their lives, to hunt and fish and travel successfully, without writing their language. They have devised no alphabet of their own. The words and phrases which appear in this "lesson" and the word-list that follows are used throughout most of the Arctic — from Greenland and Labrador westward through northern Alaska. The language spoken in Alaska south of the Yukon, and in the Aleutian Islands, is quite different, however. It resembles more nearly the language of the British Columbian Indian tribes.

The Eskimo words and phrases in this "lesson" are spelled out in a simplified system which represents the language as it sounds in English. The system contains letters for all the sounds you must make



to be understood. The English spelling used here comes as close as possible to the proper sounds to help you pronounce the words easily and correctly. For example, take the Eskimo word for walrus. This word has been spelled *iviuk* and *aivuk* by explorers, but no one can tell from these spellings what the Eskimos call the animal. Actually they call it the *ivy-uck*—the plain English word *ivy*, plus the syllable *uck*, which rhymes with *luck*. Even if you should pronounce the word to rhyme with *nook* or *spook*, it would still be understandable.

When you meet an Eskimo, you probably will say, "Hello," and the flat-faced, fur-clad man may even say something

like "Har-low" in return. If he doesn't understand your word, he'll understand your facial expression and extended hand, at any rate.

The greeting auk-shun-EYE is in use in Labrador and on Baffin Island. It means something like "how do you do?" In Hudson Bay, the most common phrase of greeting is CHIME-oh, meaning about the same thing. But there are parts of the north country where no greeting beyond an explosive eye-YIGH is used.

The ideas you will want to put across to an Eskimo will have to do mainly with such essentials as food, water, shelter and the like. The chances are you'll be hungry wherever you are, whatever the season, so you must know the phrase kah-POONG-ah, which means "I am hungry." Don't pronounce the *g* strongly. Pronounce it about as you do in ping-pong. Kah-POONG-ah is composed of parts of the words, KAH-pok (hungry) and oo-VUNG-ah (I).

The pronoun, oo-VUNG-ah (don't pronounce the *g* strongly) can be combined with various adjectives to express how you feel. The resulting phrases are not grammatical, but they are readily understandable and are much more pro-



PREPARED BY THE ARCTIC, DESERT AND TROPIC INFORMATION CENTER

nounceable than the strictly correct ones:

Oo-VUNG-ah ICK-key—I am cold.

Oo-VUNG-ah quawk—I am so cold I am freezing.

Oo-VUNG-ah COW-shook—I am wet.

The pronoun meaning "you" is IG-vee. So IG-vee ICK-key would mean you are cold or are you cold, according to the inflection of your voice. Now for a few phrases using the pronoun IG-vee:

IG-vee pee-oo-YOOK—You are good.

IG-vee COW-shook?—Are you wet?

IG-vee oo-AIR-nook?—Are you sleepy?

If you need something, you will use the phrase pee-you-mah-VUNG-ah, meaning I need or I want, together with some noun, which is the name of the thing you need. Again these phrases are not strictly correct Eskimo, but they will serve to put your ideas across:

TEE-mik pee-you-mah-VUNG-ah—I want some tea.

EE-mick pee-you-mah-VUNG-ah—I want a drink of water.

NER-key pee-you-mah-VUNG-ah—I need food.



KING-mit pee-you-mah-VUNG-ah—I want dogs.

COMMA-tick pee-you-mah-VUNG-ah—I need a dog-sledge.

If the Eskimo brings you what you want, you will want to thank him. Your new-found friend will appreciate the courtesy, for he himself is polite, no matter how uncivilized he may appear to be. So here's a phrase of thanks:

Koo-yah-nah-MICK—Thank you.

The things you will be likely to need will have to do with clothing, equipment and food. Here are some names you should know:

COM-ic—boot

KOOL-ee-rock—blouse or parka

AH-no-wah-ga—clothing

IG-loo—snowhouse

PAH-na—snow-knife

KOO-di-lick—seal-oil lamp

COMMA-tick—dog sled

EE-ko-mack—matches or fire

COOKY-oo—gun

TOO-peck—tent

NER-key—food

OO-me-ack—boat

Both oo-VUNG-ah (I) and IG-vee (you) can be combined with verbs to express simple ideas. Accurate Eskimo verb forms are exceedingly complex so about all you can hope to use is the verb-stem combined with pronouns. Here are samples:

Oo-VUNG-ah OWD-lah—I am going (the OWD rhymes with crowd).

Oo-VUNG-ah tah-KOO—I see it.

IG-vee KAH-pock?—Are you hungry?

SHOO-nah IG-vee NERRI-wah?—What are you eating?

If you want to stress the idea *your*, you may add the simple word IG-vee to the noun. Again the resultant phrase is not strictly correct, but the Eskimo will understand you:

IG-vee IG-loo—your house



IG-vee KING-mick—your dog

IG-vee PAH-nah—your snow-knife

Suppose you want to ask where something is—a lake, river, or house. The important word *nowk* means *where*. Pronounce the *ow* as in *now*.

IG-loo nowk?—Where is the house?

IG-loo IG-vee nowk?—Where is your house?

COKE nowk?—Where is the river?

Kab-LOON-ah IG-loo nowk?—Where is the white man's house (or trading post)?

COOKY-oo nowk?—Where is the gun?

The idea of bigness is expressed by the addition of *ju-ak* to familiar words. Listen closely for such lengthened words. Thus:

Ee-MACK-ju-ak—big water, ocean

Oo-mi-AK-ju-ak—big boat, ship

IG-LOO-ju-ak—big house, trading post

The idea of smallness is expressed by adding *at-suk* or *ah-pick* to words. Thus:

KING-mick-AT-suk—little dog, puppy

IG-loo-AH-pick—little house, kennel

You should know a few human interest words and phrases for use when you meet the family:



AHNG-ot—man

AHNG-e-nook—woman

NOO-tah-rock—baby

AHNG-o-ti MAR-ick—real man, he-man

AHNG-e-nook mick-i-OO—little woman

NOO-tah-rock pee-oo-YOOK—good baby

Knowing the names for a few parts of the body will help. Most of these are easy to remember because they're short:

KING-ahk—nose

Nee-AH-coke—head

Key-OO-tit—teeth

AHG-sah-cet—hands (literally, the fingers)  
IT-i-gut—feet

You will want to say *yes* and *no*, of course. There are various degrees of these ideas:

Ah-high-LA or AH-me-la—yes

Ak-shoo-AH-look—yes, indeed!

AH-guy—no

NAH-gah—no, indeed!

The weather is a good topic of conversation the world over. It is of real importance in the Arctic:

SEE-lah—weather

SEE-lah pee-oo-YOOK—good weather

AH-no-way—wind

AH-no-way pee-YUNG-i-took—bad wind

AH-no-way AH-mish-oot—much wind

AH-no-way AH-mish-oot oo-BLOO-me — much wind today

AH-no-way AH-mish-oot AH-kah-go — much wind tomorrow

ICK-key—cold

ICK-key AH-kah-go EE-mah-kah—cold tomorrow perhaps

CONN-neck AH-kah-go—snow tomorrow

You should know the names of certain Arctic animals, too. The Eskimos use these nouns often:

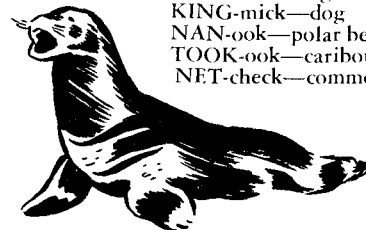
KING-mit—dogs

KING-mick—dog

NAN-ook—polar bear

TOOK-ook—caribou

NET-check—common seal



OOG-zhook—hair seal

Kelly-LOO-gak—white whale

EO-kah-look—salmon trout

MIT-tuck—eider duck

Ah-HIG-i-vik—ptarmigan

OOK-pick—snowy owl

NERD-look—Canada goose

You'll need a few everyday expressions for use in travelling, working, hunting and the like:

TOOK-oo-roo!—Look at that!

TIE-mah—It's done. The job's finished.

Let's quit.

AH-tay!—Go ahead now. Get going!

Watch-AIR-oh.—Wait a bit.

Mah-nah—Now

OWK! or HOWK!—To the right (dog driver's term)

OWK-ah! or HUH-dah!—To the left (dog driver's term)

KI-geet!—Come here! (pronounce the *i* as in *mice*)

KI-sah-geet!—Bring it here!

SEE-ko—Ice

CONN-eck—Snow (especially when it's falling)

SHFE-nah—Ice floe (open water at the edge of the ocean ice)

Before you leave your friends, you may wish to say more than koo-yanna-MICK, "thank you." Perhaps you'll say:

IG-vee pee-oo-YOOK—You are good.

IG-vee-lo AHNG-e-nu-lo pee-oo-YOOK—You and your wife are good.

(Note that the syllable *lo* is added to both words when the two are joined with *and*. Thus the expression for snow and ice would be SEEK-ko-lo CONN-neck-lo.)

IG-vee NER-key pee-oo-YOOK—Your food is good.

Tug-VAH-oo-tit!—Good-bye! ☆

# TRAINING AIDS

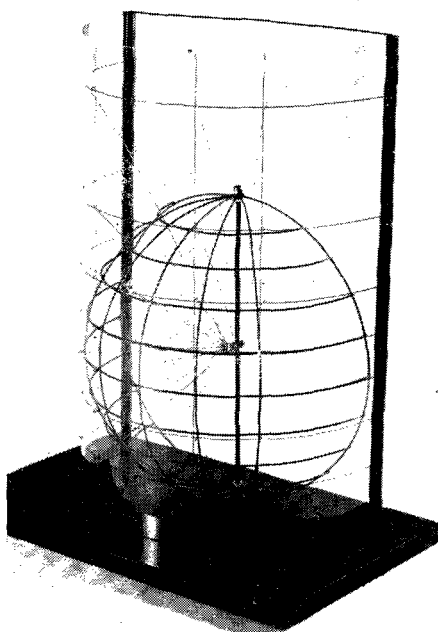
## SYNTHETIC DEVICES

**MAP PROJECTION MODELS.** In navigation training with wall charts as the only aid, students experience difficulty in grasping the third dimension factor.

Three-dimensional map projection models have been developed to overcome this training handicap. The spherical earth is simulated in a plastic hemisphere with red meridians of longitude and blue parallels of latitude. The surfaces on which points on the world sphere are projected are sheets of transparent plastic. Lines running from the center of the world sphere to the points at which meridians and parallels meet extend to the plastic sheet to represent projection lines.

The student thus may be shown clearly the method used to locate on a chart or map points corresponding to those on the surface of the earth.

The set of four models is designed to demonstrate the fundamental principles of Mercator, Gnomonic, Conic and Lambert-Conformal projections.



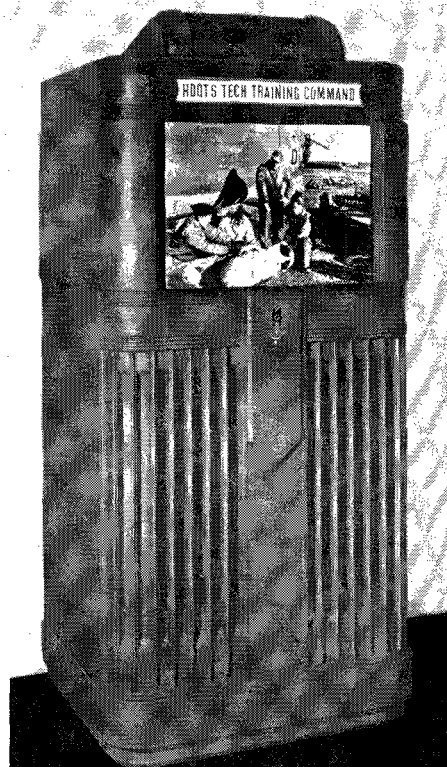
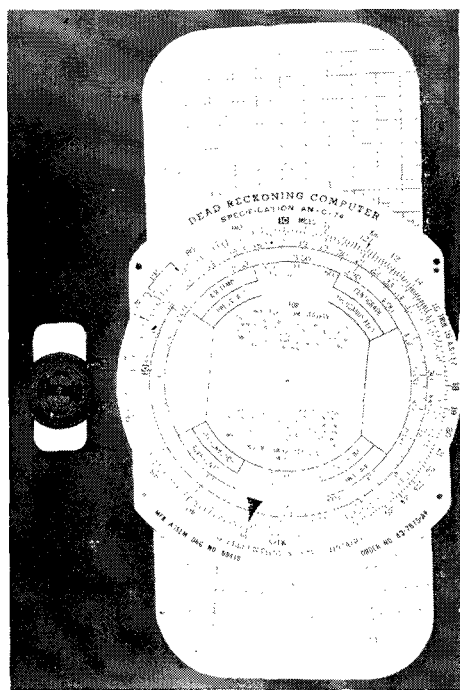
Mercator Projection

### DEAD RECKONING COMPUTER MOCKUP.

The giant mockup is being adopted as an effective aid in teaching large groups of students the use of various instruments.

The photograph shows a giant mockup of the dead reckoning computer. The regular size is shown alongside.

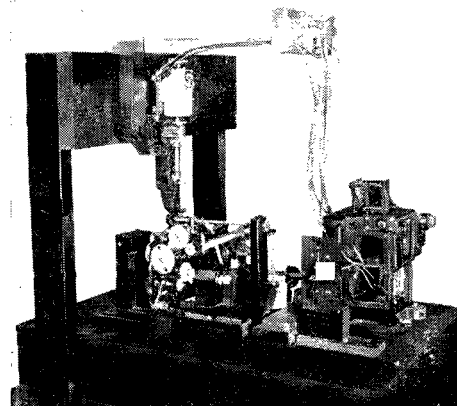
Similar blowups have been developed on the aircraft navigation plotter, the air speed correction computer and the altitude correction computer.



**JUKE BOX GOES TO WAR.** Remember the juke box you used to put a dime into for a three-minute short? You'll be seeing it again, but in GI paint and minus the dime slot. It's being used in AAF training establishments to show educational films. The projector operates with ordinary 16 mm film wound on an endless reel.

**'EXPANDED' COMPUTING SIGHT.** The extremely compact construction of the Sperry Automatic Computing Sight is an asset in the close confines of aircraft turrets, but to trace the internal movements of the sight's several gear trains through the closely knit maze of shafts and gears is difficult for new students of sight maintenance.

Accordingly, a standard Sperry K-3 Sight was "cross-sectionalized" by the



armament school work shop at Lowry Field, Colo., to make the working model shown in the photograph. The mechanism was "expanded" to provide the student an easy way to follow the movements of the various shafts and gears.

The computer assembly has been removed from the optic mechanism and further separated into sub-assemblies.

The shafts and gears related to each gear train have been painted a distinctive color, so that their motion can easily be followed throughout any operating movement of the sight.

The sight's own 27.5-volt DC motor is utilized to provide the driving power, affording the student both correct operating speed and a wiring harness to trace for proper maintenance.

Certain groupings of gears and cams normally hidden from view have been revealed by cutting away portions of the outer case of the sight.

Since the unit was intended primarily for teaching maintenance of the sight, not operation, it is not connected to a turret. However, with a few modifications, it could be adapted for this purpose. It occupies a table top approximately 30 by 40 inches. ☆

### WHERE TO GO

Information on the availability of training films and film strips, aircraft recognition materials, synthetic training devices and training literature may be obtained from the Training Aids Division, Army Air Forces, Park Avenue and 32nd Street, New York, N. Y.

# 'COURAGE IS NOT ENOUGH'

*By First Lieut. Peter J. Packer*

## FLIGHT CONTROL COMMAND

*The following fiction story was written by Lieutenant Packer as the basis of a scenario for a safety education film to be produced by the AAF First Motion Picture Unit in collaboration with the Flight Control Command.—THE EDITOR.*

TOMMY and I went through flight school together—pre-flight, primary, basic and advanced. We got along swell. Both of us were a long way from home, kind of homesick at first. But when a couple of fellows get to know each other real well, it makes things a hell of a lot easier.

I always thought Tommy was right up there with me when it came to getting passing grades until the time he flunked a fairly simple instrument quiz. Tommy just laughed it off, and I didn't pay much attention to it. I knew he had just received a letter from Joan, telling him that she'd marry him as soon as he graduated, so maybe that was the reason. Anyway, it wasn't important enough to be concerned about at the time.

In the air Tommy was a swell pilot. He took to the air like a duck takes to water, and his instructor had very little trouble with him. After six hours of flying time, Tommy could do more with his ship than most fellows can do after twenty. He was always raring to go when flight periods came around.

I admit quite freely that Tommy was a better pilot than I at that stage of the game, and from one standpoint he was a better pilot right up to the last. He was a natural when it came to aerobatics, and most of us in flying school were betting that Tommy was going to be the best fighter pilot in our class.

Well, you know there's a lot to flying you have to learn on the ground before you can take to the air. Some of it is dull, plodding material that just can't be made glamorous except to a congenital glamour boy.

Let me give you an example. It comes out of a tech manual:

"Scale error is defined as the algebraic

difference of the standard pressure altitude and the indicated altitude when the altimeter is subjected to the pressure corresponding to the standard altitude (altitude chamber text)."

See what I mean?

Most of you know how to get the meat out of that piece. Anyway, I hope you do. Maybe you don't know it the way it's written in the book, but I'll bet when you are looking at your altimeters you know exactly what corrections to make for scale error.

If you cottoned to it the way I did, you tried to grasp as much as you could from the book, and when it got too much for you, you got your instructor to tell you about it in plain American—with gestures.

At any rate, I knew it was something

**Tommy could have been a world-beater as a pilot but he elected to throw the book out the window.**

I had to know. It didn't matter how I got it, so long as I knew it when I needed my altimeter.

Tommy slept through that lesson.

I remember that night in study hall when I said something to him about "pressure altitude variation," and he looked at me as if I were talking to him in Arabic.

Did Tommy pass his tests? Sure, he passed enough of them to get through. When a subject had him floored, he'd cram like hell just before the test and come to the classroom with a bellyful of half-digested facts which he'd shoot at the test paper like machine gun bullets. Ten minutes after the test, his mind would be a beautiful blank on the whole subject.

When I talked to him about it, he'd give me that world-beater smile of his, and tell me to quit worrying about him.

All he was waiting for was the day when he'd be at the controls of a P-51 with his finger on the gun button, and a couple of Messerschmitts riding on the sights.

You know, when I think it over, it seems to me they just couldn't have washed Tommy out, even if he'd flunked every written examination in the school. He was too damned good in the air.

The way Tommy dove at a target and hit the bull was a cure for all the headaches in Washington. Tommy was a natural fighter. They just couldn't wash him out.

No matter how well you know a guy, no matter how much you're on his side, you just can't keep after him when it comes to studying. Either he gets all worked up about it and tells you to mind your own business, or else like Tommy, he says:

"Sure, I'm coasting through. I've got no time to waste on AT-6s, or that stuff you get in the classroom. A ship is like a car, see! You don't have to learn anything out of a book. You get behind the wheel and away you go. So instead of gear shifts, you've got elevators. Instead of brakes, you've got flaps. Instead of a steering column, you've got ailerons. Simple!"

So—we graduated.

As I said, Tommy always knew just enough at the right moment to get by. And the way thousands of us are going through the schools these days, there is never any one instructor who has time to concentrate on any one cadet.

There never is time, in wartime.

Tommy passed his tests, and that was the gauge the instructors had to his ability. The rest was up to him, as it was up to the rest of us.

The Air Corps used to be an outfit where every man was hand-picked, where every move he made was watched and studied and analyzed. He didn't have to be good. He had to be perfect.

But that was in peacetime, and many of the pilots who came out of the Air Corps in those days went to work for the commercial airways. I don't have to show you a graph of their record for you to know how good they were. American airline pilots are the best in the world.

So the Air Corps has to depend on the men themselves. It gives them everything it can in aircraft, equipment and knowledge. It gives them every last minute of time it can possibly spare to turn a pre-flight cadet into an airman with wings. And after that it gives them something that is like a letter of credit, a warrant of its belief in them. This letter of credit which each of us gets, is a sort of a green light to our Commanding General, which tells him that his Air Force is stronger by one more pilot, one more navigator or one more bombardier.

Don't look for that letter of credit in your 201 File. It isn't in writing. You



won't be able to walk into Wanamakers and order a camel-hair coat on the strength of it. But your squadron commander may be able to put out a field order that'll knock some Japs off the map on the strength of it.

All this isn't exactly about Tommy—but I guess it does have a bearing on the case.

Two days after we graduated Tommy and Joan were married. I was best man. They were married in a little place in Ohio where Joan's folks live.

A week later he and I were flying P-51s out of Patterson Field.

It was the same Tommy who had gone through cadet training—a whizz in the air and a stinker when it came to learning stuff that wasn't directly concerned with putting a cannon shell into the belly of a Dornier.

I remember one time we were flying formation. They made me the element leader and Tommy was my right wing man. We went up to 8,000 through the overcast and that was the last I saw of Tommy until I came down. He came in smiling about half an hour after I landed, with not enough fuel left for his cigarette lighter.

"What happened?" I asked.

"I stayed on the heading like you said," he told me.

"What heading?"

"One twenty."

"It was one forty, Tommy," I said. "For Pete's sake get hep to that navigation if you want to stay in the game."

Tommy smiled—world beater again.

"There I was," he said. "Just like I figured it would be in actual combat. And below me, maybe at 5,000 is a Heine bomber. He noses out through a break in the clouds, then he's hidden again, and I'm pretty sure he hasn't seen me. So what do I do. I make a 180 turn, climb a piece just to give myself lots of room. Then I make another 180 turn, and I dive, and believe it or not I am on his tail before you can say Schickelgruber. I let him have it. Bingo, the tail gunner is out. I let him have it again. Off comes the top turret. Then just before I climb out of his road, a lucky one gets him in the bomb bay, and it's all over."

"Did you actually do all that maneuvering Tommy?"

"Only in my head," he told me.

"And ended up 20 degrees off course. Nice going. You could have hit a mountain or something."

"Ain't nothing but hills in these parts," he grinned.

"How'd you get back?"

"Why, Steve, I know this country like the back of my hand. I let down to where I could see it."

What can you say to a guy like that?

Three months later we were in England. We flew with the Mosquitoes at first to get to know the country. Then

they put us on missions of our own. We strafed railroads, airdromes, ammunition dumps—any damned thing we could find.

Tommy was a wizard. Enemy camouflage never fooled him. He could see stuff from the air like a chicken hawk.

One time when I thought he was lost—again—I had a wire from Brighton:

"HAVING WONDERFUL TIME. WISH YOU WERE HERE."

How he ever got to Brighton, which is on the south coast when our base is a hundred miles north of London, beats me.

"Had a little trouble with that Channel fog," he told me when I finally caught up with him. "Don't they ever have clear weather in this country?"

WHEN you're in combat you don't ride a guy the way you might back home. You have to use indirect methods to tell a man what you want him to know, like when I wanted Tommy to try and pick up a little more theory on instrument flying.

I took him along as my co-pilot on a night flight in a two-engine ship. I pretended to get lost and left it up to him to try and get us back. If I'd left it to him long enough, I think we'd have wound up in Iceland. Anyway, when he started figuring our position and making calculations, I almost wept. He was terrible.

I hoped the lesson would stick in his mind. Instead, he told me what a great flying partner I was, and he would never have to worry about getting in a jam so long as I was around.

"But supposing I'm not around," I said.

"Nothing's gonna happen to me, with Joan over there waiting for me to get back," he said. "Not a chance."

I don't pay much attention to luck, but Tommy had it if anyone did. He always got back—somehow. He was strictly a lone wolf when he did get back. He'd stay with the formation until we got to the target, but if we got in a fight he'd stay right in there until the fight was over, then lose himself. You could almost always bet your last dime that Tommy would never be at the assembly point when the others were. He either got home way ahead of us, or way afterwards.

So I began to believe in luck—until it happened. Then I knew it wasn't luck, but some complicated part of the law of averages which allows a guy to stay out of trouble for so long and then hits him when he least expects it.

It was a little place in Holland this time. I can't remember the name of it. Maybe I don't want to remember it be-

cause it'll always be tied up in my mind with Tommy Newton, with the law of averages, with the damned fool stubbornness of a guy who might be here today getting a medal pinned on his chest, and with a wife crying her heart out and having nothing to look forward to but the memory of the guy she loved.

You can't blame what happened on the weather, because we all came back. All except Tommy. He stayed in the North Sea. It wasn't good flying weather, but it was good enough to take a crack at the target and get back. It was a new flying field we'd heard about, and it was supposed to be crowded with those 16-year-old Nazi pilots. We wanted to throw a good scare into them before they knew what it was all about.

There was a fog, turbulence, ice—the works. And that's another thing Tommy never quite caught up with, weather. He could have learned about it and mastered it as well as the next guy, but he just didn't think it mattered too much. Weather wasn't a cannon in the spinner; weather wasn't .50 calibers in the wings. And because cumulo-nimbus didn't pack a wallop for the enemy, it wasn't important.

I knew what kind of flying we were headed for, so I took Tommy aside and made him promise he'd stay right beside me out and back. Tommy laughed and promised, and I like to feel that he kept his promise until it was just beyond his power to do so.

We got to the target, and we shot that place up from end to end. Altogether, we got nine Messerschmitts on the ground that trip, and headed for home—and believe it or not Tommy was right beside me. We came out over the North Sea about twenty miles north of The Hague. That was our assembly point and that was where we started to run into the storm area.

I got the signal from the leader for a 45-degree turn left with letdown to 2,000, and it was when I made that turn that I lost Tommy. I don't know exactly what happened, but I can guess that he balled up on the letdown, went off course and started flying contact, because contact was the most natural way for him to fly.

But the North Sea isn't like the country that Tommy knew like the back of his hand. Over the North Sea through an overcast, you fly instruments, damn it, or you don't fly! Tommy flew until he could fly no more. That's all I can say.

So we lost him.

I guess that's all there is to it. Tommy had everything that it takes to make a great flyer. He had guts, he was absolutely fearless, he was an ace in everything but respect for the laws by which a fighting ship fights not only its enemies who wear a swastika, but its enemies in the atmosphere. Tommy never learned that courage isn't enough. ☆

#### PICTURE CREDITS

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## OCS—AUSTRALIA

(Continued from Page 24)

spent an afternoon, not speaking very much of navigation but of the last days of the Philippines and the epic flight of his big ship. Combat pilots, weather men, operations and intelligence officers, harassed depot officers, all gave us their time. We began to gain a broad perspective of the Southwest Pacific war theatre, and to comprehend the organization of the Army Air Forces. It began to add up to a single meaning that explained the early months on New Guinea and in the Northern Territory when the supplies were short and slow in coming, when the fighting equipment was against fantastic odds. The dry facts of administration began to explain the need for their existence, the need for tight organization. But it did become clearer than ever before that since it is true wars cannot be fought without paper, it is equally true that paper alone cannot win wars.

THE last weeks went swiftly. The class hurdled the final obstacles and held the affection of the second lieutenant of Infantry, who brooded over his platoon like a mother hen over her chicks, to the last. The daily drill and discipline did not ease up. It was a ninety-day course, the colonel had said, and if a man cannot take it for ninety days, the army suffers no loss. The threat of the final board hung over the camp like a pall, but it finally cleared away the Sunday before graduation—not without exacting a price. It is always hard to say good-bye to the men who have gone down.

Classification day was entirely and typically without ceremony. The AAF officers sat behind a small desk in an empty barracks, asked each man his experience and preference, wrote the recommendation and guaranteed all possible cooperation. The technical men, concerned over the possibility of administrative assignments, were assured that they had been pigeon-holed for their original departments since the first acceptance of their applications. The Panama infantry veteran stood outside, waiting his turn, biting his lips against the dreaded possibility of being chosen as an instructor. Five minutes after his name was called he walked out, stepping on clouds, inarticulate with relief. "Intelligence, boy, intelligence!" The two men chosen as instructors stood in the center of the sympathetic platoon, smiling wanly as they thought of their seven-day leave gone over the hill. The next class was to begin in five days.

We graduated at ten o'clock in the morning. At eleven, a group of the newly commissioned Infantry officers were rushed to the airport and loaded into a waiting transport that took them away on the first stage of their journey across the Hump, into the newly occupied territories

of New Guinea. A small group of the Engineers looked at their orders, cursed feelingly, shook hands all the way round and reached for their baggage. They were going north the hard way—by train, then by boat to isolated, newly opened areas. And the Air Corps? The thirty of us were extremely grateful to Miami, for we had been given seven days leave—and only because a group of Miami men had arrived to fill the vacancies and relieve the pressure at last.

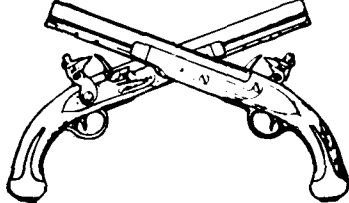
There was the matter of pay, of course, but we didn't mind the wait in the open area in front of the first company's or-

derly room. We needed time to become used to the feel of a commission. Then it was only another move to load onto the waiting trucks for the ride into town—but this time we weren't wearing the blue patch on our left shirt pocket. There was a gold bar on our collar, and a long planned dinner awaited us in that sanctum of sanctums where air-conditioning had been installed and there was, actually, ice in the well-prepared drinks.

New Guinea, with its oppressive heat, torrential rains, fetid swamps and crawling biting insects, was seven days away. That's a world of time, over here. ☆

**Lower your mental flaps and land on the AIR FORCE Quiz for this month. Score five for each question answered correctly. One hundred is perfect; ninety, a three-point landing; eighty, good; seventy, a little bumpy, and sixty, a close call. Watch out for cross-winds. Answers on Page 56.**

1. The horsepower developed by each engine of a B-24 is
  - a. 800
  - b. 2,000
  - c. 1,400
  - d. 1,200
2. The 11th Air Force Hq. is in
  - a. Australia
  - b. Hawaii
  - c. Alaska
  - d. Panama
3. Which word is inappropriate in this grouping?
  - a. Sextant
  - b. Octant
  - c. Pelorus
  - d. Aerostat
4. If you stall at 4,000 feet in a trainer, you should
  - a. Push the stick forward and increase engine power
  - b. Shut off the engine and go into a glide
  - c. Pull the stick back and increase engine power
  - d. Lower flaps and go into glide.
5. Rangoon is located
  - a. In Jap occupied Northern China
  - b. In India
  - c. Off the coast of Southern China
  - d. In Burma
6. The name given to the P-47 is
  - a. Marauder
  - b. Maryland
  - c. Thunderbolt
  - d. Mustang
7. In the first six months of 1943, the U. S. lost 846 planes in aerial combat. The enemy lost approximately
  - a. 1,000
  - b. 1,300
  - c. 2,100
  - d. 3,100
8. Assuming perfect visibility, the maximum distance the human eye can see from 10,000 feet is
  - a. 87 miles
  - b. 123 miles
  - c. 58 miles
  - d. 43 miles
9. The age limit for an Aviation Cadet is 18 to 26 inclusive
  - a. True
  - b. False
10. General Mitchell Field is located in
  - a. New York
  - b. Texas
  - c. Wisconsin
  - d. California
11. A lever labeled auto-mix is used on
  - a. A jeep
  - b. PT-13 instrument panel
  - c. Oxygen equipment
  - d. Engine fuel adjuster
12. The angle of incidence is an
  - a. Angle at which wings are attached to fuselage
  - b. Instrument used by navigators in plotting course
  - c. Angle at which stalling occurs
  - d. Instrument used by bombardier in lining up target
13. What is the distinction between true altitude and indicated altitude?
14. The RAF equivalent to the AAF rank of captain is
  - a. Flight lieutenant
  - b. Pilot officer
  - c. Wing commander
  - d. Group captain
15. The Technical Training Command and the Flying Training Command have been combined. The name of the new command is
  - a. AAF Training Command
  - b. AAF Training and Technical Command
  - c. AAF Flying and Technical Command
  - d. AAF Technical Command
16. The Medal of Honor is never awarded to enlisted men
  - a. True
  - b. False
17. Wewak is located in
  - a. New Guinea
  - b. The Aleutians
  - c. Burma
  - d. Northern Australia
18. Identify this collar insignia
 


19. The average rate of parachute descent per second at near-sea level is approximately
  - a. 35 feet
  - b. 20 feet
  - c. 10 feet
  - d. 2 feet
20. If an unexploded land mine is found in your camp area, it is best to
  - a. Notify the supply sergeant
  - b. Remove the detonator carefully without moving the mine
  - c. Put the mine in a bucket of water
  - d. Notify the ordnance officer



# FROSTBITE

**F**ROSTBITE quickly loses its allusion to humor in high altitude flying where severe cold can make an exposed hand useless in a few seconds. The airman who, through excitement or carelessness, allows himself to get severely frostbitten while in the air subjects himself and his crew to danger and endangers the success of the mission as well. In the case of a gunner, it means the aircraft will be vulnerable in the area his gun protects.

Brig. Gen. David N. W. Grant, the Air Surgeon, reports that severe frostbite, particularly in the European theatre, is responsible for a large percentage of the hospital cases among airmen. Many of these cases have resulted in the loss of fingers, mutilated hands and permanent disability. Flight surgeons report from the field that the human element is usually a contributing factor in cases of frostbite. This means that most of them could be avoided. The problem of frostbite, therefore, like so many others in aerial warfare, depends largely upon the individual himself. The accompanying picture, showing the hand of a gunner in the 8th Air Force, reveals what can result from a few seconds of exposure in high altitudes.

**F**ORTUNATELY, by following a few simple rules, an airman can protect himself from the serious consequences of frostbite.

In the first place, it is essential to wear the proper clothing and to wear it correctly. The clothing must be dry—even the most imperceptible moisture may lead to frostbite. Drying rooms, available at all fields, should be used. Wearing flying clothes before time for stations may cause perspiration to collect and lessen by thirty percent the efficiency of the clothing. Men with electrically heated suits should wear no more than the prescribed clothing underneath. This means one suit of winter underwear and one pair of woolen socks. There is no limit to what can be worn over the suits.

Men who have worn four pairs of woolen socks under their electrically heated boots, removed their hand protection for too long while unjamming a gun, or forgotten to test their suits before take off, have all regretted it. One waist gunner tried to change his oxygen mask at high altitude and took the easier way by removing his electrically heated gloves. In a few seconds his right hand was frozen so badly he was unable to use it again—and his formation was under attack by FW-190s. Other gunners have suffered severe frostbite because they forgot, after replacing their gloves, to plug them again into the suit's electric system.

It is also important that no clothing, including shoes and gloves, be tight fitting in high altitude flight. Such clothing restricts circulation and hastens frostbite.

Experience has shown that rubbing hands, feet and face with lanolin, olive oil or anti-freeze jelly will reduce somewhat the likelihood of frostbite because of their fat content. Flight surgeons recommend that crews on operational status rub one of these on the hands, face and feet every night for one week and then twice a week thereafter.

Despite all precautions, however, frostbite may occur. In such cases it is essential that the affected area be protected from further damage. Above all it should never be massaged and must be protected against further cold or excessive heat.

It is common sense that freezing can be of varying degrees, and should any persistent numbness or coldness of a finger, toe or portion of the face develop, it is of utmost importance that the individual report to his flight surgeon immediately. If this is impossible, the next best thing to do is warm the affected part very slowly and without rubbing. When treatment is neglected, even when the coldness and numbness does not seem severe, the results can be serious injury and permanent disability. ☆

## The Wail of the Bombardier

By Lieut. Chester Turbak  
24th Antisubmarine Squadron

*I am now a Navigator;  
I have drawn the big Mercator;  
I'm a cross feed operator—  
Yes I am!*

*Why, I plot our new position  
Under any old condition,  
And work hard on every mission—  
Uncle Sam!*

*Now to be the big sensation  
Of our little aggregation,  
Take up "DR" navigation—  
It's the thing!*

*They can't get along without you;  
There's that certain thing about you;  
In a pinch they dare not doubt you —  
You're the King!*

*Now the Pilot does the flying  
While the Bombardier is spying  
And the Navigator's crying,  
"Where are we?"*

*Then he whips out his Weem's plotter  
And he flips his lucky quarter.  
Then looks down and sees the water—  
"We're at sea!"*

*You can't be a Jusvy chooser;  
If you are, you are the loser;  
Use the E-6B confuser  
When in doubt.*



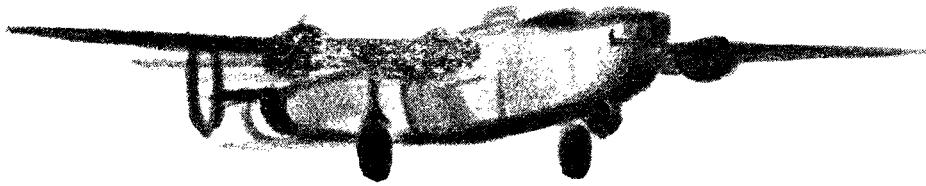
*It tells you where you're goin'  
Even if the weather's snowin';  
If it's wrong then start a-rowin'  
If you're stout.*

*When our plane begins a-roamin'  
And the pilot is a-foamin',  
Then we just start in a-bomin'—  
Right away!*

*So we tune in on the station  
Till we reach our destination,  
Where we get the big inflation—  
Hip Hurray!*

*And now friends, in conclusion,  
You must pardon this intrusion;  
There is really no confusion  
In our ranks.*

*With the proper inspiration  
You can make your navigation  
The just pride of our great nation—  
WE, THE YANKS!*



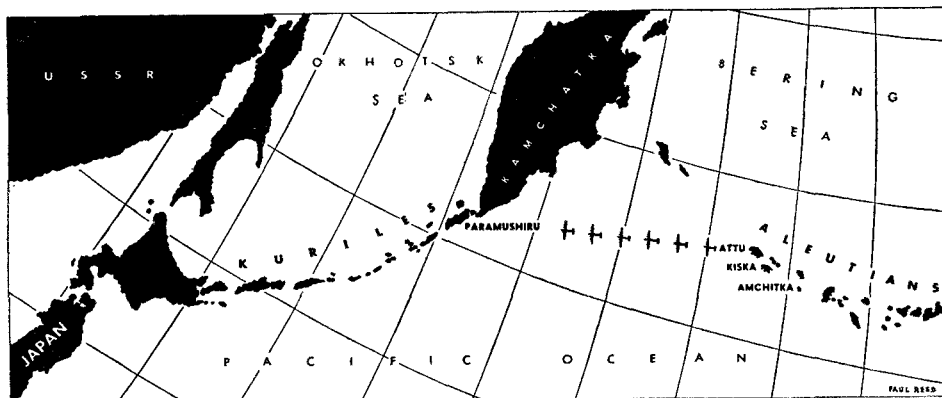
## Bombs for Paramushiru

(Continued from Page 19)

appeared to be as much of a surprise to the Japs as the first, perhaps because our approach was hidden by the overcast until we came within a short distance of the targets. They seemed to be on the alert this time, however, because planes were seen to take off the ground while we were still on our run and it wasn't long until the air was full of Zekes, Rufes, Haps and Oscars. During the running fight that continued for

which extended almost to the waters of the Bay. The whole field—runway, parking platforms and all—must have been as level as a billiard table because they seemed able to get off in any direction.

The anti-aircraft crews were on the job this time, and puffs of smoke started blotching up the sky before we were actually over the targets. It was black, apparently of large caliber, and pretty hot toward the last. Fortunately, it was accurate only for altitude and not for course. It appeared to be of the barrage type, aimed for a certain altitude over the



about 45 minutes, there were observed several other types including one Watanabe Zero, a float reconnaissance plane and one plane with fixed landing gear, painted silver with a black stripe on either side of the fuselage.

In the waters of the strait we could see a large concentration of ships.

It was a beautiful sight, the fluffy white overcast stretching away in all directions except for the big blue hole over the target and the rugged mountains on the southern part of Paramushiru sticking up through the clouds. But the scenic effect was only momentary. It was suddenly broken by the Jap planes swarming up through the overcast like bees out of a hive.

The runway extends north-south on a low plateau north of the army staging area. The Zekes were parked on a string of little T-shaped hard surface platforms beside it. As we came over they took off, apparently as each plane got ready and without any regard for formation. They taxied straight ahead across the runway, taking off from a large area to the east

target. As at Kiska, the most accurate fire seemed to come from ships in the harbor, rather than the shore batteries.

"A" flight got away its load including the incendiary clusters from 11,500 feet, one string hitting a group of large buildings in the naval base area on Shimushu and a second about a hundred yards to the left in another building area. The third disappeared into a low cloud so that the result could not be observed. The interphone sounded as though some kind of a convention was going on as explosions and fires from the incendiaries were observed by various members of the crew.

After all the bombs were away, "A" flight made a diving turn to the left, leveled off at about 5,000 feet and fol-

lowed the southern coast of Shimushu to Nakagawa Bay whence it headed out over the sea toward home.

"B" flight proceeded over the Kashiwabara staging area dropping its eggs from between 10,000 and 11,000 feet. All struck in the target area along the shore, where explosions and fires were seen. One pier was demolished and a vessel beside an adjoining pier overturned. After completing its run, the flight continued around the south post of Shimushu to join "A" flight for the return trip.

Just before "C" flight reached its target, the shipping in the strait, Captain Wadlington noticed that some of the larger vessels were hidden by low overcast and made a sharp turn to the south, planning to come back over the army staging area for his run.

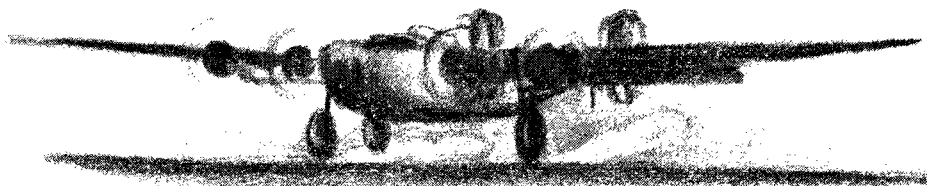
ALL three planes executed the right turn but when the flight made a second turn of 180 degrees to follow the northerly course, Captain Hoffman, apparently misunderstanding the maneuver or, perhaps, having some difficulty with his plane, continued to the east. His plane was last seen flying southeast at about 12,500 feet, pursued by two Zekes which, however, were still out of range. His plane did not return to the home airport and it is not known whether he was forced down on some other landing place.

The other two ships of the "C" flight dropped everything they had on the staging area from 12,000 feet. The bombs struck a large warehouse and some adjoining buildings which were seen enveloped in smoke and flame. After the run both ships dove to about 1,000 feet to take advantage of the cloud cover as they followed an easterly course across the northern part of Shimushu.

While the anti-aircraft fire did not bother us a great deal, despite its intensity, the Jap planes did. There were about forty in all, mostly Zekes, armed with two or three machine guns and some with cannon. Six Mavis four-engine flying boats were on the water in the harbor and about 25 or 30 other planes could be seen on Bettobu Lake east of the naval base, but none of these took off.

The attacks lacked coordination and were not always pressed determinedly but they kept after us until we were well on our way home, a few of them for forty or forty-five minutes.

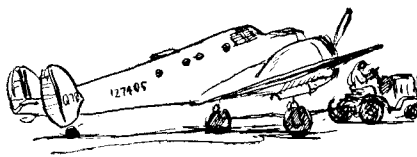
They attacked alone or in pairs and some, probably the green pilots, veered



away before coming in range, even when they had numerical superiority. Their favorite angles seemed to be 5 and 7 o'clock from which they could use the two vertical stabilizers as a shield to protect them from the top turret and tail gunners. However, several times attacks were made from the front at about 11 o'clock, perhaps for variety. Most attacks were made from our level although occasionally one dived and came up from below.

Most of our gunners had come up from the States as replacements only a few months before and had never had an opportunity to fire at a Jap plane until that day. Nevertheless, they worked like veterans, warning each other over the interphone as the enemy was getting out of range of one gun and within range of the next man's. They were cool as cucumbers throughout the whole attack, although there was hardly a plane in the fight that didn't have three or four Japs buzzing around as we started the return trip.

We got five planes that were confirmed and six probables which we are certain would have been confirmed had it not been for the overcast. We could see the probables diving into the clouds but since we couldn't see them hit the water no confirmation was possible. Six more were damaged.



Two of the positives were credited to Lieutenant Lockwood's plane. Two Zekes, coming up from below, attacked simultaneously, one at 11 o'clock and the other at 5. Lieut. Merle E. Arthur, navigator, gave the one coming in at 11 a burst at about 500 yards. The Zeke broke off and trailed smoke as it went into a dive and exploded after diving about 2,000 feet. Staff Sgt. Walter Succov, tail gunner, and Sgt. David L. Carter, belly gunner, got the other one from about 900 yards. The Zeke pulled up into a stall and fell off on the right wing with flames coming from the engine. It dropped into the ocean. A Hap followed this one down, circled the wreckage and climbed up to follow the plane again, but staying at a pretty safe distance.

LIEUTENANT LOCKWOOD's plane, still plugging along on three engines, was damaged considerably in these and other attacks and began to lose altitude. The crew had a field day throwing things overboard to lighten the plane, and the ship was pretty well stripped in short order. It descended through the overcast and was flying at only about 200 feet when the crew got one of those thrills that brings your heart right up into your mouth. All three motors quit together due to a vapor lock. With exceptional presence of mind, Lieutenant Lockwood quickly threw on his booster pump and turbos and held his breath. Sergeant Carter in the belly turret was only fifteen or twenty feet above the white caps when all three motors started again. The plane gathered headway and climbed to a safe altitude.

While all the ships got plenty of attention from the Japs, Lieutenant Smith's plane, the last one over the target, probably got more than the rest. He became separated from Captain Wadlington in the cloud cover at about 1,000 feet, and had a running fight with ten Japs who followed him across the northern part of Shimushu Island and more than a hundred miles out to sea. At one time there were three Japs on each wing and four on the tail. Three were shot down positively and one probably, while two others were damaged in this melee.

Staff Sgt. Ira Edwards, waist gunner, got one of the positives—a Rufe that peeled off, did a vertical roll and came down from above. Edwards got in several bursts, and the Rufe did a wingover and burst into pieces almost in front of Smith's plane.

Staff Sgt. A. Dumas, tail gunner, knocked a piece off the left wing of a

Zeke coming in from 7 o'clock. It went out of control at about 1,500 feet and dove straight down into the water.

Staff Sgt. William C. Nichaus, waist gunner, accounted for the two-float Watanabe Zero, with tracer fire seen to enter the cockpit. The plane fell off into a spin from 1,500 feet.

More than twenty passes were made at Smith's plane during this running attack but the crew, in a fine display of teamwork, kept the Japs so far away that only a few small caliber bullet holes were noted in the fuselage when the ship was checked after the trip.

On the way back two Japs were seen from Lieutenant Lockwood's plane descending by parachute about thirty miles east of Shimushu and two planes were seen not far away burning on the water. However, there was no way to tell how the planes had been brought down or whether the two pilots had bailed out of the two planes on the water, since they were beneath the overcast and none of the action had been seen.

Later, Lieutenant Pottenger radioed that he had lost No. 4 engine and was unable to feather the prop. He also reported one supercharger was on fire. "A" flight throttled down in order to enable him to keep in formation but his plane continued to drop behind. He was last seen about 3,000 yards to the left as the flight went into a cloud formation at about 5,000 feet.

The other seven ships returned to Attu, Lieutenant Lockwood's plane only a few minutes late despite its damaged condition. The Paramushiru mission was officially over but we were not quite through with the Japs. Returning to our home base the following day, we flew over Kiska and made what proved to be our final bombing attack on that target. ☆

### MISTAKES IN 'ON THE LINE' PICTURE ON PAGE 44

(Reading from left to right)

1. To remove the tire from the hub with a pair of screw drivers is practically a job for Superman. Friend, use a tire iron which is blunt on the end and won't cut into the rubber. Reference: TO 04-5-10.
2. Oh no, not that, please! The ladder leaning against the leading edge of the stabilizer will harm the skin fabric.
3. Bad business to insert that twelve-inch crescent wrench between the leading edge of the elevator and the trailing edge of the stabilizer to hold the elevator in horizontal position. A pair of hands is the required "tool" to hold the elevator in place.
4. You, standing there in front of the jack, it's dead wrong to take dents out of a trim tab with a pair of pliers. Dents are removed by pressing the trim tab between two wooden blocks. Reference: TO 23-15-1.
5. Caught in the act, pal! You ought to know better than to stand on the stabilizer. It isn't constructed to withstand a man's weight. Besides those GI shoes are plenty tough on the airplane's skin.
6. The same guy up there has the wrong version of "safety in numbers," namely, the number of boners he's committing are in opposition to safety! To remove a bolt from the rudder hinge, hammer and screw driver are the *wrong* tools; they will ruin the bolt, and should the screw driver slip it will damage the rudder skin. A punch or drift is to be used here. Reference: TO 01-65BC-2. And by the way, that long screw driver in his breast pocket can jab him or someone else in the ear.

### Answers to Quiz on Page 53

1. (d) 1,200 horsepower.
2. (c) Alaska.
3. (d) Aerostat.
4. (a) Push the stick forward and increase engine power.
5. (d) In Burma.
6. (c) Thunderbolt.
7. (d) 3,100.
8. (b) 123 miles.
9. (a) True.
10. (c) Wisconsin.
11. (c) Oxygen equipment.
12. (a) Angle at which wings are attached to fuselage.
13. The altimeter reading gives you indicated altitude. True altitude is obtained from the indicated altitude by correction for atmospheric conditions and instrument errors.
14. (a) Flight lieutenant.
15. (a) AAF Training Command.
16. (b) False.
17. (a) New Guinea.
18. Military police.
19. (b) 20 feet.
20. (d) Notify the ordnance officer.



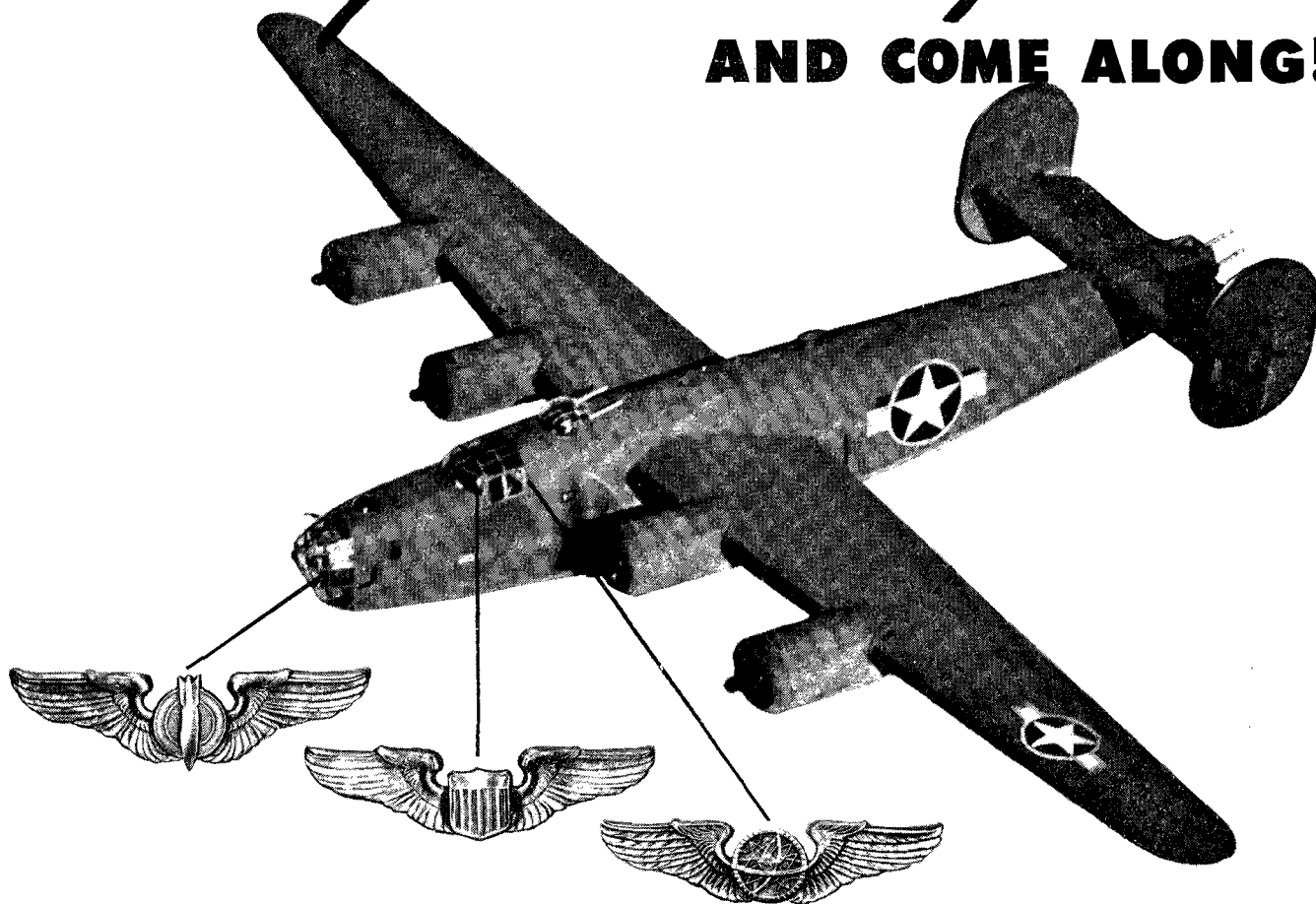
**PHYSICALLY FIT...**



**THERE'S A PLACE FOR YOU ABOARD...**

*Win Your Wings*

**AND COME ALONG!**



Enlisted men between the ages of eighteen and twenty-six inclusive, whose organizations have not been alerted for foreign duty, are eligible to apply for aviation cadet training to become bombardiers, navigators or pilots. Application blanks, AGO Form 60, can be obtained from commanding officers, the nearest Aviation Cadet Examining Board, U.S.O. clubs or recruiting offices.

Army regulations (AR 615-160) provide for transportation, at government expense, of enlisted applicants for air crew training to the nearest Aviation Cadet Examining Board to determine qualifications, if one is not located on your post.

Your seventeen-year-old friends may also apply for this training by qualifying for enlistment in the Air Corps Enlisted Reserve.

If you previously applied for air crew training and were rejected for physical reasons, you may try to qualify now under the relaxed physical standards recently announced.

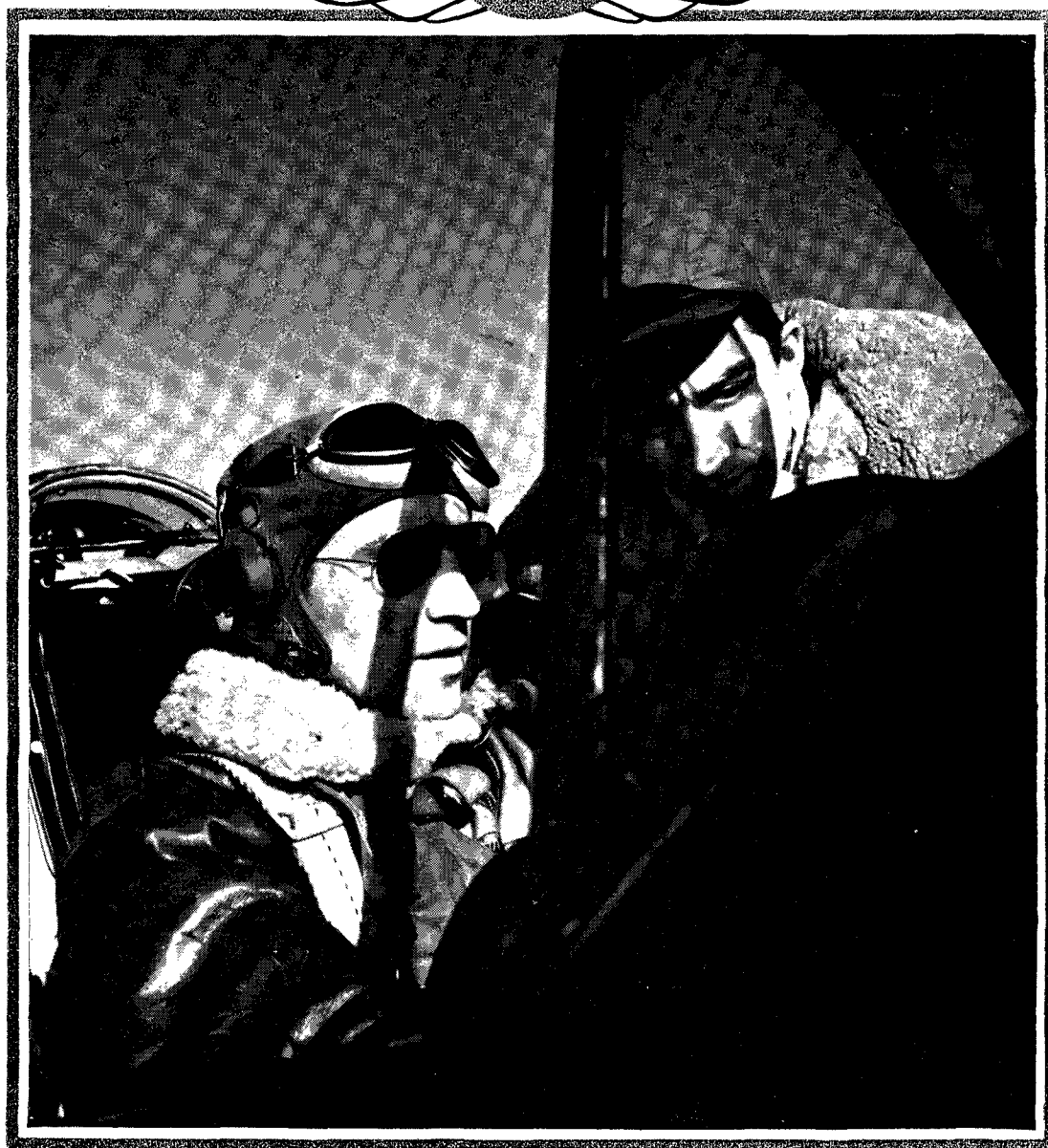
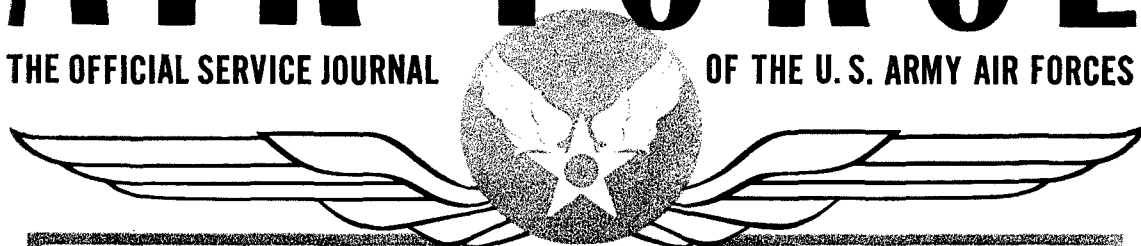
**You can apply now for  
AVIATION CADET**

**AIR  
CREW TRAINING**

# AIR FORCE

THE OFFICIAL SERVICE JOURNAL

OF THE U. S. ARMY AIR FORCES



DECEMBER 1943

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AIR FORCE is primarily a medium for the exchange of ideas and information among Army Air Forces personnel. Opinions expressed by individual contributors do not necessarily express the official attitude of the Army Air Forces or the War Department.

## AIR FORCE

THE OFFICIAL SERVICE JOURNAL

OF THE U. S. ARMY AIR FORCES



## December Brief

**WHAT WILL HAPPEN** to you when you are ordered back to the States from a theatre of operations? If you are not physically fit for further combat, will there be a non-combat assignment for you? Will you have the opportunity to see your family? How will you be reassigned?

The answers to these and many other similar questions are to be found in the article on Page 5 which describes the establishment of a redistribution program by the Army Air Forces. The program is a result of months of study by Headquarters personnel officers. The detailed flow chart which accompanies the article portrays each step in the reassignment process, from the time an officer or enlisted man is ordered to return from his overseas station until re-assigned in this country.

**ONE OF THE** greatest aerial battles in history was fought during the mass bombing raid on Regensburg August 17. A vivid account of the mission appears on Page 9 in the form of an official report written by Lieut. Col. Beirne Lay, Jr., a co-pilot on the raid. Colonel Lay, who served at AAF Headquarters prior to his assignment with the 8th Air Force, is the author of the book, "I Wanted Wings," based on his experiences as an aviation cadet. Colonel Lay has returned to the States for transition training in B-24s.

**THE GRAPHIC STORY** of the old Henderson Field control tower and its operators, which appears on Page 37, was prepared on Guadalcanal in answer to a request by higher authority in the Army Airways Communications System for a history of tower operations at the base. "Henderson Tower" is no dry history; it is a vivid, fast-moving sample of life in the tower during those hectic early days. Co-authors of the article are Capt. J. E. Roberts, a security officer and former newspaperman, and Staff Sgt.

John R. Dunn, a former advertising copywriter, who has since returned to the States to enter Officer Candidate School.

**THE DISPLAY** of ingenuity on the part of ground crews, both at home and overseas, has been one of the most important factors in the present air war. In their ability to make something out of nothing when a situation demands it, our ground personnel—officers and men—have been without parallel. AIR FORCE this month begins a new feature on these men, based on maintenance reports received from combat theatres by the Air Service Command. Read "On the Combat Line," Page 26.

## The Front Cover

There is no greater bond in this war than that between a fighter pilot and his crew chief. The pilot has the wings, but his crew chief sweats out every minute his plane is in the air, seems to care more than the pilot himself whether his plane and his pilot come home intact. This month's cover picture, taken by Tech. Sgt. Roger Coster, staff photographer, portrays this spirit. It is a scene that is re-enacted thousands of times a day around the world, wherever the men of the Army Air Forces are fighting.

## THE AIR FORCE

Roll of Honor feature has been redesigned this month to permit the inclusion of more names and to afford easier readability and identification. The number of AAF officers and men receiving decorations has increased considerably during the past few months, resulting in the accumulation of a backlog of names. Until this surplus is exhausted, AIR FORCE will devote additional space to the feature. Three pages of names appear in this

issue, beginning on Page 34.

**A NEED** for a better understanding of the proper use of the navigator's astro-dome is expressed in the article on Page 12 by Col. Thomas L. Thurlow, chief of the instrument and navigation unit of the Materiel Command equipment laboratory. Colonel Thurlow tells how the dome can be employed to best advantage by navigators.

**FROM THE STANDPOINT** of the armorer, we are designing guns and putting wings on them. A progress report on our developments in firepower by Col. Frank C. Wolfe, chief of the armament laboratory at Wright Field, appears on Page 14.

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# CROSS COUNTRY

**I**MPORTANT revisions are being made in the Army Air Forces training program with the following principal objectives:

- (1) To coordinate training activities.
- (2) To provide standardization and continuity of instruction.
- (3) To bridge existing gaps.
- (4) To insure maximum use of equipment and manpower.
- (5) To correct shortcomings indicated by operational experience.

On September 20 at Colorado Springs, 260 officers engaged in various phases of AAF training met to re-examine the program, convening by committees for studies of specific problems. Brig. Gen. Robert W. Harper, Assistant Chief of Air Staff, Training, returned to Washington with a stack of committee reports and recommendations.

In cooperation with the Training Command, the training air forces, and other agencies involved, moves are under way to effect many of the Colorado Springs proposals.

Most important of the changes are those affecting flexible gunnery instruction. Revisions in gunnery training are being made in all the air forces and commands. Flexible gunnery instruction is being started in the 1st and 4th Air Forces, which now are undertaking bombardment training as well as fighter training.

To make sure that flexible gunnery training progresses smoothly from one phase and one agency to another, schedules and curricula of the Training Command and the training air forces will be closely coordinated. By more effective liaison, the training schedule of the air forces will be made to pick up exactly at the point where that of the Training Command leaves off. By continued instruction and practice in the air forces, a maximum of gunnery training will be provided. Gunnery instruction has been handicapped in the past by lack of towing airplanes.

Further to standardize gunnery teaching, a manual is being prepared for use

in all schools. It will become the bible of gunnery instructors. The Central Flexible Gunnery Instructors School will furnish gunnery instructors to the training air forces as well as to the Training Command.

As rapidly as practicable gunnery officers will be provided for squadrons, groups and wings to supervise training, to assist gunners and to see that equipment is kept in good condition.

A significant development in gunnery training is the use of the AT-23 airplane, a B-26 stripped down for target towing. Because of its exceptional maneuverability, it is admirably suited to this purpose. Tests have shown that at 22,000 feet the AT-23 can make 25 runs on a B-17 in 45 minutes. The calibrated air-speed of the AT-23 while towing targets at this altitude is 190 to 200 miles per hour.

Revisions also are in progress in the training of navigators and bombardiers.

The bombardier course is being increased from twelve weeks to eighteen weeks to allow a six-week instruction period in dead reckoning navigation. By May, 1944, every man who graduates as a bombardier will be proficient in dead reckoning navigation. This should not be confused with the existing 27-week course for students who graduate as precision bombardier-navigators.

As further evidence of current emphasis on broader training, an effort is being made to process all group commanders—present and future—through a modified course of navigation, bombardment and gunnery training. This will be done as the manpower and tactical situations permit. As an experiment, a two-weeks' course for group commanders has been conducted at El Paso, Texas.

Increased realism is being sought in tactical training. Combined fighter-bomber training in each of the domestic air forces is the principal step to be taken towards that objective. Having both fighters and bombers available will permit practice operations under conditions closely simulating those found in actual combat. Here-

tofore for training purposes, the 1st and 4th Air Forces have had fighter units only, the 2nd has had heavy bombardment only, and the 3rd has had medium and light bombardment and fighter units. Heavy bombardment training is being added in the 3rd Air Force.

To give greater effectiveness to these combined operations, it is planned to increase the minimum flying-time requirements for fighter RTU pilots, now sixty hours.

As another form of combined operation training, the 3rd Air Force has two groups working with units of the Army Ground Forces on tactical maneuvers.

As soon as practicable, all instrument instructors will be graduates of the AAF Instructors School (Instrument Pilot), Bryan, Texas. A set of minimum qualifications for instructors has been established as a temporary measure until AAFIS graduates can be used exclusively.

Since September 1, the Training Command has been able to furnish to the training air forces qualified four-engine airplane commanders in sufficient numbers so that transition training in the air forces is unnecessary. This will mean that additional time will be allowed to turn out better OTU groups and RTU replacements.

## SMART OPERATOR

Tech. Sgt. Herman Sachnoff is the type of individual who thinks you can believe about half of what you hear. On the way to a bombing target in the Mediterranean theatre, this B-25 radio operator received a message—in the proper code of the day—to change course and attack a different objective.

The message seemed proper enough, being correctly coded, but Sachnoff became suspicious. At that particular spot over Africa he had never been able to get strong signals from his base, and this message came in surprisingly clear. By using his radio compass the sergeant was able to determine that this message was coming from a direction ahead of his position, although his base was located



in the rear. Realizing now that it was an enemy message, he radioed back to his base, warning them of the fake. The B-25s proceeded to the original target.

On the way home, the sergeant's flight passed about 150 Allied fighters heading at 30,000 feet toward the false target. When these fighters reached the area to which the attempt had been made to lure the B-25s, they found 45 Messerschmitts circling at 20,000 feet, waiting to ambush the B-25s. The Allies dove on the MEs and destroyed thirty of them. Sergeant Sachnoff received the Distinguished Flying Cross—for being the type of guy who doesn't believe everything he hears.

## GENTLEMEN BE SEATED

Although maintaining planes in fighting trim is their big job in combat, ASC personnel in theatres of operations frequently are called upon to perform tasks which are but remotely related to keeping 'em flying. From the 9th Air Service Command in the Middle East comes the report that a squadron CO, Capt. E. P. Kapal, was more than a little annoyed when his trained aircraft woodworkers were given the job of turning out a batch of toilet seats for the boys. However, the craftsmen laid to with a will and produced more than 1,000 seats in two weeks. These were considered ample for the moment.

## FAMILY SPIRIT

You can add up the achievements of the Army Air Forces in many ways, but sooner or later you become aware that our victories are won as much by the spirit of our men as by the excellence of our equipment and the superiority of our methods.

That spirit builds up into what we know as a "family feeling," a relationship among personnel that characterized the Air Corps when it was so small the Commanding General knew virtually every officer and enlisted man by name. Somehow, over the years, it has been maintained, even in an organization that exceeds two million men.

The family spirit manifests itself in the desire of Air Forces personnel to "look after their own," and often reaches outside the service to encompass the relatives and friends of men who go down in line of duty. One such example is this letter to the Commanding General from a father who lost his pilot son in action. The letter reads:

Dear General Arnold:

This letter is the quite unexpected and unanticipated sequel to letters I wrote to you and General Marshall early last May. Added to what I wrote then, it completes the story of what *must* be the *perfect* example of what you wish every unit in your Air Forces could do for every flyer killed in action, and his family.

When I wrote you in May, I believed that it would be impossible for any squadron to do more, or more promptly, than the men of the \_\_\_\_\_ Squadron did for our late son, Captain \_\_\_\_\_ and his folks.

But I was wrong, for in July Major \_\_\_\_\_, Squadron Intelligence Officer, took time from his short leave with *his* family to visit us. With him he brought intimate stories of Jack and the squadron, a picture of Jack snapped the morning of his last flight and a priceless memento of their long trip across the desert...

Then, about three weeks ago, our son's close friend who was with him on that last flight spent a day with us. He filled in a lot of the background. We heard his stories, saw his souvenirs, read his diary, saw his pictures, and everything proved to us that our son had been well, happy and lucky until that last second.

But the grand climax, which I don't think any human being or organization could plan or produce, came about ten days ago at \_\_\_\_\_ Field. The occasion was the formal military presentation of three posthumous awards to Jack, with his mother, his little sister and myself present to accept them.

The arrangements had been made most thoughtfully and considerably through correspondence with the Special Awards Office, AAF, Washington.

The day was perfect and we looked forward to meeting at least one member of the \_\_\_\_\_ squadron at the ceremonies.

Now, the miracle! Can you imagine the thrill, the joy and the prideful consolation we experienced when our escort, Lieutenant \_\_\_\_\_, took us into the Base Officers Club, there to find *seven* men from Jack's squadron

burg, for new battles and new buddies, fortunately, soon take the place of the old for soldiers.

Knowing this, we consider ourselves blessed above any other parents of whom we have ever heard. Like many thousands we have lost a son in action, but unlike most others we have had the rare consolation of the unbelievable chain and combination of circumstances listed in this and previous letters.

I feel sure that if it were in your power to do it, you would wish every family to receive the same breaks that have been ours, when death takes a flying son under your command. But you can't put such a perfect "military operation" in the rule books.

To top off the marvelous demonstration of "esprit de corps" in your Air Forces, we learned *that* Friday night that taking part in the military review that day were some fifteen Air Forces enlisted men who had known our Jack seven to fifteen years ago, back in grade school. When they heard of the award ceremonies, they voluntarily cancelled their week-end leaves and begged to be allowed to march with the selected squadron. And they did. We don't know who they were, even.

But that ought to make you feel almost as happy as it did us, an evidence of the extent and character of the high morale you've worked so long and hard to inspire in the Air Forces.

Because I feel that you have set the tone and standards for the Air Forces which developed in our case, into this incomparable story, I have written to thank you.

Sincerely,

## THE GLIDER TRAINING PROGRAM

The Training Command again is accepting applications from AAF enlisted personnel for glider pilot training.

Enrollments were cut sharply a few months ago. A number of men were dropped from the course and assigned to domestic air forces. Increased current requirements, however, have caused the Training Command to reopen the enrollment on a limited scale.

Glider pilot training is available only to volunteers between 18 and 37 who have completed basic military training. They must have evidence of having flown at least 125 hours as an aircraft or glider pilot, including a minimum of 25 hours within the past year.

Applications should be submitted through channels to Headquarters, AAF Training Command, Fort Worth 2, Texas.

## FINAL WARNING

A list of names, recently posted on the bulletin board of a squadron at Harlingen (Tex.) Air Field, was accompanied by these terse instructions: "The following enlisted men will pick up their Good Conduct Medals at the supply room this afternoon. Failure to comply with this order will result in disciplinary action!"

## CANDY AND KIDS

Staff Sgt. Ronald R. O'Neil, 43-year-old combat cameraman in England, wanted to celebrate the seventh birthday of his little boy back in the States. Since he couldn't be with his own son he decided to entertain seven boys, all seven years old, on his son's birthday. In preparation for the celebration, O'Neil began



"Furthermore, we don't announce approaching Jap planes by saying 'Ceiling Zero!'"

—J. T. RAWLS & SGT. P. J. KAATZ.

who had trickled in from north, south, east and west by noon that day—together, themselves, for the first time since they had started coming home five and six months ago!

I'll never know how it happened or who was responsible. Maybe you and God. But how they all heard about it, how that date fitted into their seven different schedules of duties, transfers, leaves, etc., so that they could all turn up that Friday afternoon for their buddy's "last commencement"—well, that's something I've quit trying to figure out; for in that group of four majors and three captains were all Jack's squadron officers—the men who'd written us those marvelous letters, sent us the photographs taken where and when they found our son's grave—tentmates and classmates from cadet days, men we *felt* we knew and had known well for the past year and a half. Of course, we had dreamed of meeting all of them somehow, someday, but always admitted that it was only dreaming. Such things don't happen, for the world keeps moving—and *fast*—in wartime. Yesterday's dead heroes and yesterday's "decisive" victories soon become old stories, akin to Civil War heroes and Gettys-

saving his candy and gum rations. When the boys in the mess hall heard of the plan they gave the project a hefty boost by volunteering to bake a huge birthday cake with all the trimmings for the party. Meanwhile O'Neil's buddies in the combat camera crew tossed their candy and gum rations into the pool. By then there was enough for sixty kids. When the party was held the guests of honor were seven boys, seven years old—but 53 other children from an English orphanage were also invited. Sergeant O'Neil served a hitch in the other war and has another son with the AAF in Sicily.

#### DRAW ONE

A bomber group at an advanced base in northeastern India had not received its regular ration of beer. To expedite the matter they sent a B-25 down to Calcutta to pick it up. The pilot whizzed down and took aboard 3,000 pounds of canned beer. When he got back the pilot gave the field an excellent buzzing. When he pulled up, however, the bomb bay doors opened and the installation was given a terrific beer bombardment. One officer, sitting in his quarters, vows that a case came flying through an open door, slid across the floor and out an exit at the other end. We have learned from witnesses that most of the beer was salvageable.

#### PARACHUTES—LOST AND FOUND

Lost:

Numbers 42-31759, 42-3757, 42-37259, 42-37325, 42-37345, 41-6358, 40-1151, 40-2174, 40-1354, 40-1262, 40-1251. Return to Office of the Engineering Officer, Base Engineering, APO 839, care of Postmaster, New Orleans, La.

Numbers 41-10499 and 40-516. Return to Office of the Engineering Officer, 73rd Sub-Depot, AAF Bombardier School, Midland, Texas.

Numbers 42-281807, 42-442071, 42-331000, 42-324870, 42-442928; return to Property Adjustment Board, Municipal Airport, Nashville, Tenn.

Number 42-92320, detachable type; return to Operations Office, Headquarters Midwestern Procurement District, Municipal Airport, Wichita, Kansas.

Numbers 39-153, 42-289607, 42-389261. Return to Headquarters and Headquarters Squadron, 1st Tactical Air Division, Morris Field, Charlotte, N. C.

Number 42-292819, (Type S-1); return to Office of Operations Officer, 57th Fighter Squadron, Bartow Army Air Field, Bartow, Fla.

Number 41-41586 (Type B-7); return to 57th Bombardier Training Squadron, Kirtland Field, Albuquerque, N. M.

Number 41-9061 (Type S-1), No. 42-144998 (Seat type); return to Base Operations Officer, Kindley Field, Bermuda. Found:

Number 42-668816 is held by Headquarters, Air Cargo Depot Detachment,

Air Service Command, 179 E. 8th St., St. Paul, Minn.

Number 41-15817 (Type S-1) is held at Office of the Supply Officer, Headquarters 71st Sub-Depot, Key Field, Meridian, Miss.

Numbers 42-409548 and 42-652279 (Type S-1) held by Base Operations Office, Army Air Base, Lincoln 1, Nebr.

#### 'AIR CORPS AIRS'

As a follow-up to our mention of "Air Corps Airs" last month, we report that it covers songs airmen have sung since 1921. The new song book naturally includes the official song of the AAF and from there takes off in every direction from "Wings on High" to "The Ground Crew," not forgetting that well-mated pair "He Wears a Pair of Silver Wings" and "Round Her Leg She Wore a Purple Garter." The flight runs from stout-hearted "Sons of Randolph" right down the line to "Beside the Brewery at St. Mihiel."

The book is bound in blue, water-repellent stock with the Air Corps insignia prominently displayed in gold. The songs are divided into five sections classified as Popular Songs, 1922-1943; Hymns, A West Point Interlude, Light-Hearted Songs of Death and Destruction, and Post War. This book was made possible from an editorial standpoint largely through the efforts of Mrs. Barton K. Yount, wife of the commanding general of the AAFTC, and Harry Fox, president of the Music Publishers Protective Asso-

ciation, who handled the considerable chore of dealing with copyright owners. Thirty-two publishers gave releases for songs in the book.

#### BETTER TO GIVE. . .

Sixty-five American soldiers responded recently when the British Red Cross asked for volunteer blood donors at an ASC supply depot of the 8th Air Force. It all started when the British Red Cross asked Capt. Al Ryan, group surgeon, to aid in obtaining plasma. So great was the response of Americans that the appeal had to be suspended after all the bottles had been used. The men have asked for another chance to help their Allies, however, and a second blood bank will be conducted.

#### PIN-UP BOY

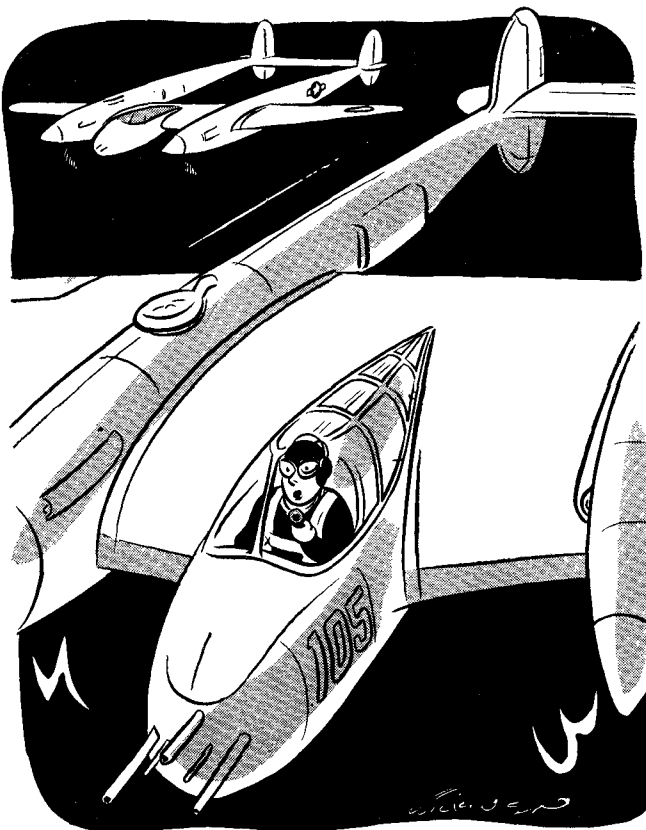
The picture of a commanding general appearing on the office walls of his staff is not at all unusual, but it is news when a commanding general asks for the photograph of a flyer to hang on his own wall. Lieut. Gen. George C. Kenney, commanding the 5th Air Force, made such a request when he learned that Capt. George P. Dunmore, a bombardier, had sunk six Jap ships for a total of 20,500 tons—a record that other bombardiers in the area have yet to equal.

#### POST WAR PLANNING

One of our scouts has just returned from an airbase in the midwest where he met a comely WAC lieutenant stationed at the base engineer's office. In the course of conversation, it developed that this girl was a Chicago debutante before joining Colonel Hobby's ranks, with a flair for night life, low-cut evening gowns, orchids and champagne. All in all, it was a sudden change-over to her trim, tailored, olive drab service clothes. However, the girl seems to have found some compromise. Each payday she goes downtown and buys herself the sleekest, laciest night gown she can find. She never wears them. Just folds them away in her footlocker.

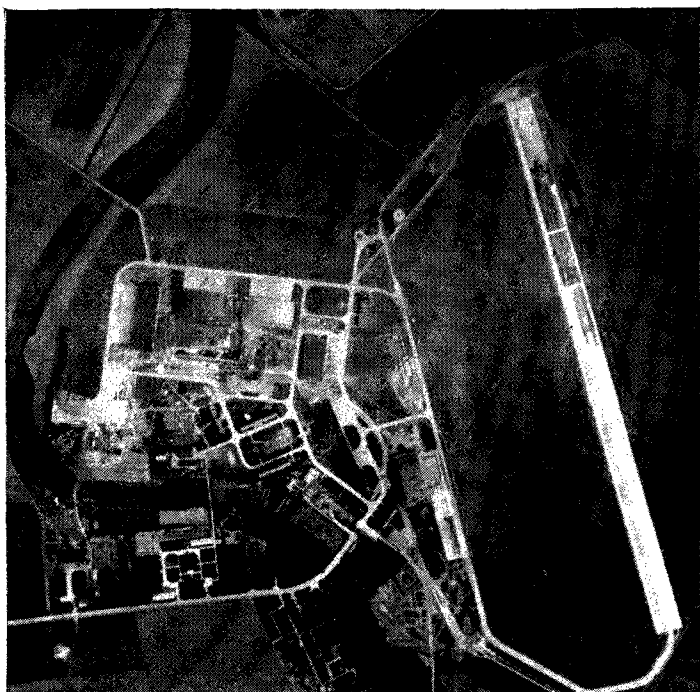
"Everytime I get depressed I open my locker and look at them," she explained to our scout, who retired in disorder.

—THE EDITOR.

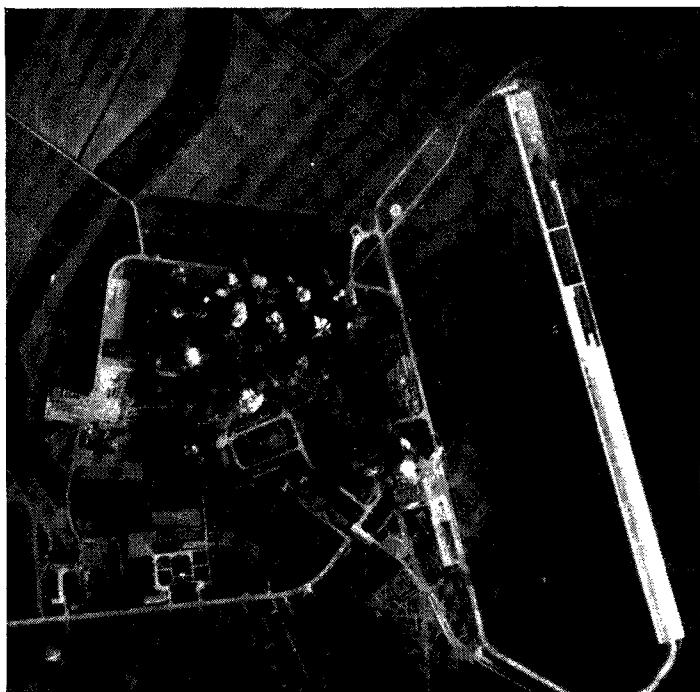


"Was that Focke-Wulf at eleven o'clock 'standard' or 'war' time?"

—FRITZ WILKINSON



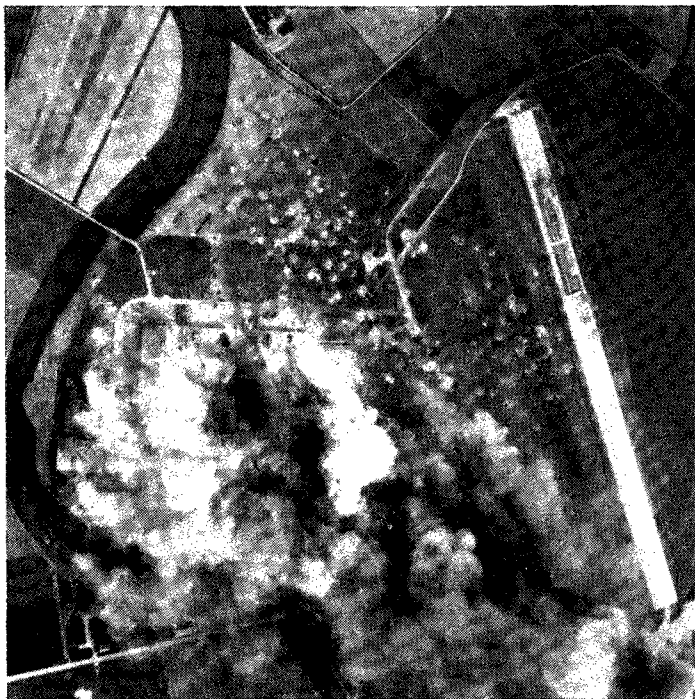
1—On October 9, in their deepest penetration into Germany to date, B-24s and B-17s of the Eighth Air Force attacked as one of their targets the Focke-Wulf 190 factory at Marienburg in Eastern Prussia



2—General Arnold has termed this attack the finest examples of daylight precision bombing. In the photo above, the first bombs blast the factory, one of the Nazis' largest plants for fighter aircraft assembly.

# Knockout Punch

3—Bomb bursts and fire billow up into an enormous mushroom of smoke and debris over the vital target as showers of missiles find their mark.



4

4—Reconnaissance photo after the attack shows the assembly shops, hangars and other structures entirely devastated by the accurate bombing.



# RETURN FROM COMBAT

## How the Army Air Forces are pioneering in a program for handling personnel coming back from the war zones.

**T**HE Army Air Forces have set up a redistribution program to insure the proper handling of all personnel—officers and enlisted men—returning from overseas theatres of operations.

Without precedent in the armed forces of the United States, the overall plan provides as its major objectives:

(1) That men returning to the States for change in duty assignment are properly conditioned mentally and physically to assume new duties.

(2) That the right men are placed in the right jobs.

(3) That battle casualties are afforded the best possible treatment.

(4) That guidance toward civilian re-employment is given, when required, in cases where a physical disability discharge is indicated.

The redistribution program has been developed by the office of the Assistant Chief of the Air Staff, Personnel, and because of its widespread application and definite departure from the old hit-or-miss assignment system, progress of the plan is being watched by other branches for possible adaptation to the entire military service.

As a supervising agency for the program, the AAF Redistribution Center has been established within the office of the A/C of Air Staff, Personnel, and headquartered at Atlantic City, N. J. The Center will act with full authority and in close coordination with the Office of the Air Surgeon.

Necessity for a redistribution program of some sort became apparent last winter, coincident with the increase in the number of returnees from overseas theatres. It was evident that several thousand returnees would have to be processed each month and there was no well-formulated system for accomplishing this. In the absence of a better method, assignments were made on the basis of reports and personnel records. The inevitable result: men reported for duty before they were sufficiently rested and before they had appetites for new jobs—and there were many misfits.

The Air Forces' solution to the problem is based on the premise that each returnee must be handled as an individual,

not as a number which represents certain basic qualifications. As a result, the AAF program provides individual planning for every man returned to the States from overseas. The schedule is detailed: exactly what the returnee will do from the day he gets his farewell processing at his overseas station until he reports for his new assignment, or is given his discharge from the service for physical disability. The time consumed by the reassignment schedule will depend upon the circumstances—the returnee's and the Army's—but in no case will the returnee report for a new assignment until the AAF is satisfied that he is fit, ready and correctly placed.

Officers in charge emphasize that the program is still in the experimental stages. It is just getting into operation, and it will grow as the load grows.

As the program is now shaping up, here's what will happen to you as a returnee from a combat zone:

Any one of four reasons might account for your being sent back to the United States for reassignment:

(1) Your turn might come up in a regular rotation of overseas assignments.

(2) The Air Forces might feel that your skill and experience are needed back home.

(3) You might be suffering from fatigue.

(4) You might be disabled and in need of hospitalization.

Before you leave your overseas station, you are given a thorough physical examination and provided with clothing and equipment needed for the journey home.

At the embarkation point, Army doctors look you over again to determine

whether you have a communicable disease. A recheck is made on your uniform, equipment and personnel records.

Now, assuming that you are returning by boat, you are assigned to a "reception station group" according to your home state. For example, if from Kansas, you and all the other Kansans in your contingent are assigned to the same group. The ranking officer in each group becomes the group leader.

The exception to the geographical group system is the man who is sick or injured and requires hospitalization. He returns on a hospital boat, and upon arrival to a U. S. port of debarkation is taken immediately to an Army General Hospital. It may be the hospital nearest the port or the nearest one that specializes in the kind of treatment he requires.

The boat on which you and your Kansas friends are riding docks, say, at New York City. There, you are given another physical checkup. What happens to you from that point depends on which of three physical groups you belong in:

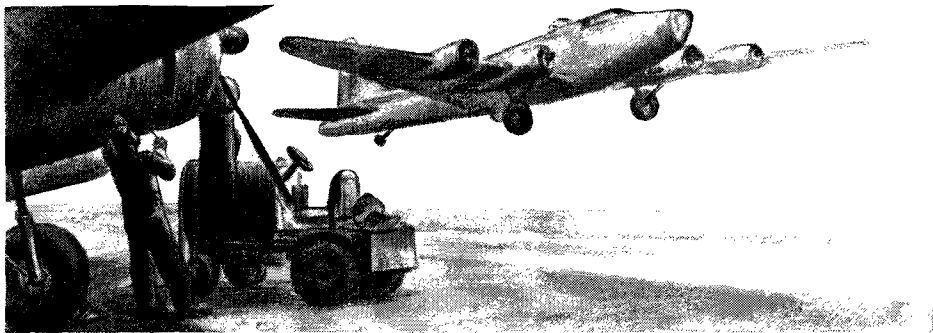
(1) Those requiring no medical treatment.

(2) Those suffering from operational fatigue.

(3) Those requiring treatment in a general hospital.

If you are in the first group, you join the other Kansans who are physically fit and board a train on which reservations have been made for you. You are still under the command of your Kansas group leader, and you travel at government expense to the interior reception station of the Army Service Forces nearest your home.

At that point your personnel records are checked and brought up to date. Assisted by a liaison officer of the AAF, you draw any uniform and equipment items needed for the furlough you are about to get. Then for twenty days you are free to go home or any other place you choose.



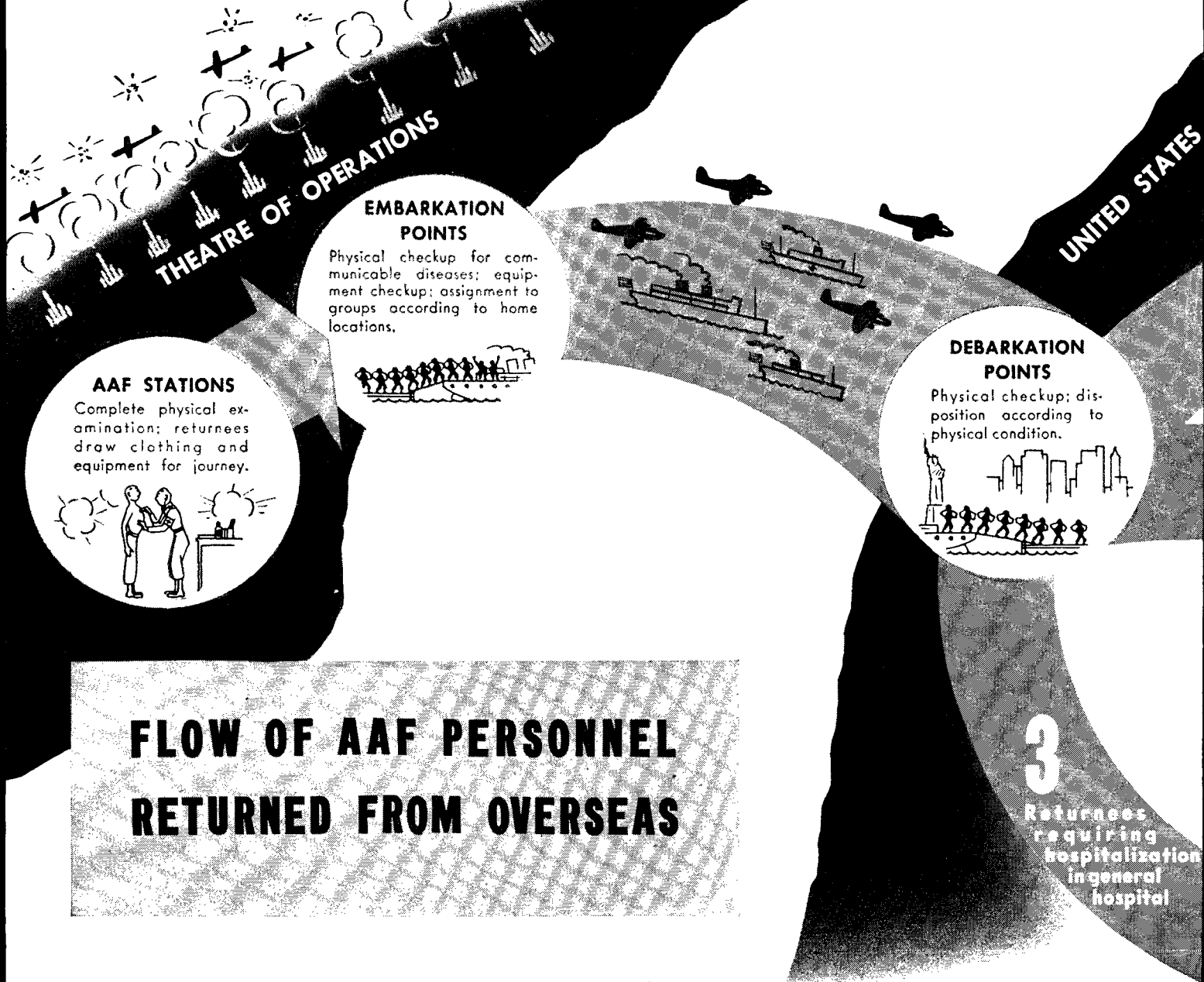


CHART BY JAMES T. RAWLS AND PFC. EDWARD R. COLLINS

Furlough travel is at your own expense.

Returnees in the second group—those suffering from operational fatigue—are sent from the port of debarkation directly to an AAF convalescent center for treatment, rest, observation and—when their condition permits—military and physical training. If it appears that a returnee's condition will not permit his return to military duties, he is given vocational training to help him obtain and hold a job when he is discharged from the Army.

The first convalescent center has been opened at Coral Gables, Fla. Others are being organized at Mitchel Field, N. Y., Jefferson Barracks, Mo., San Antonio, Tex., Buckley Field, Colo., Santa Ana, Calif., and Fort George Wright, Wash.

Members of the third group—those requiring hospitalization—are treated in a general hospital and later sent to a convalescent center. Men who make the re-

turn crossing by air are handled in the same manner as those who arrive by boat. Upon debarkation at Miami, Fla., for example, the schedule at the airport is similar to that at the ship landing point.

But to get back to you and the home folks in Kansas, upon the expiration of your 20-day furlough, you will report to an AAF redistribution station in the general geographical area of your home, where your quarters for the next couple of weeks will be a hotel which not long ago was catering to vacation clientele. It has been leased by the government to house you and other returnees while personnel officers study your case and decide on your next job.

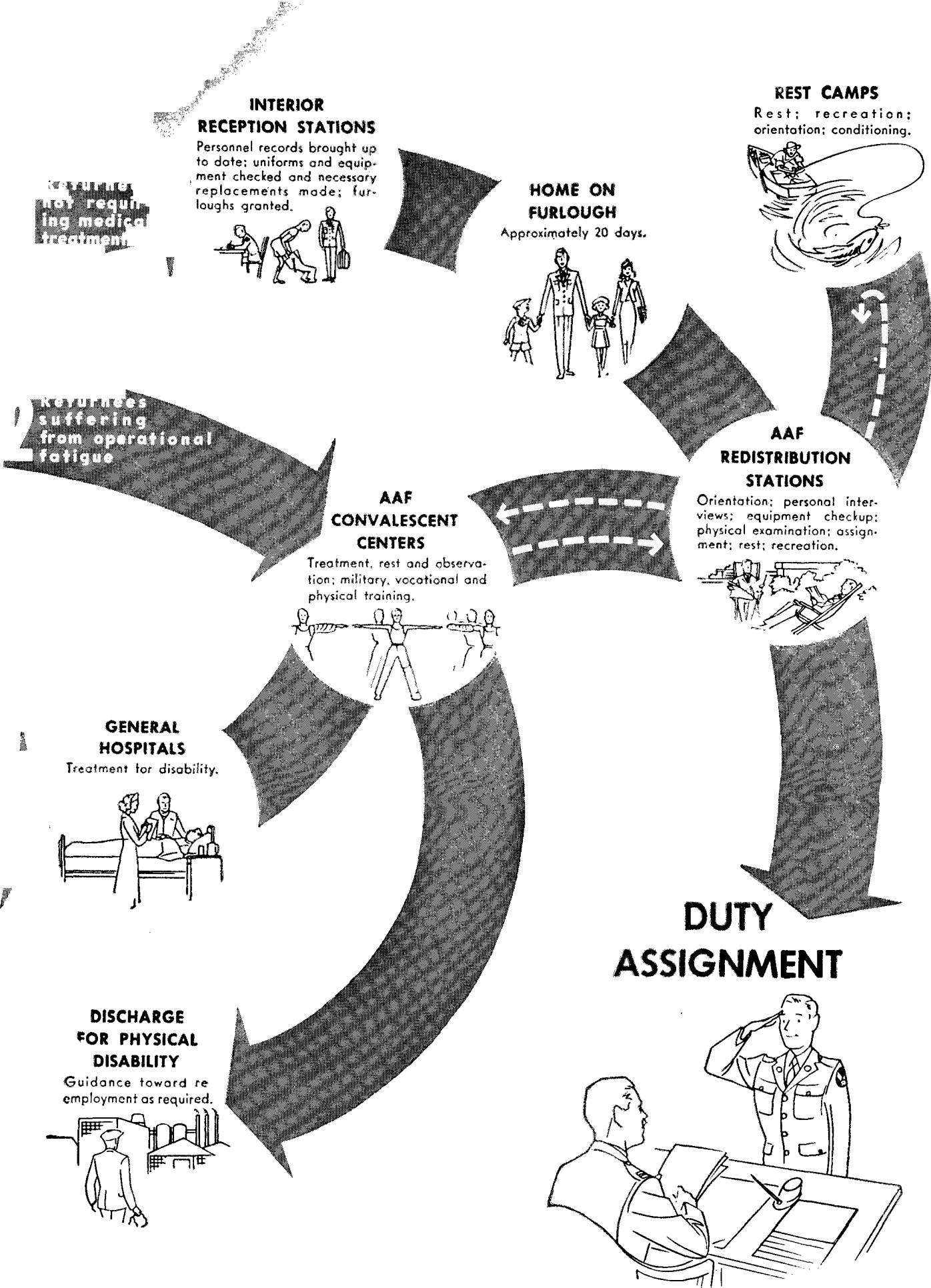
Two redistribution stations are now operating, one at Miami Beach and the other at Atlantic City. A third is being established on the west coast and a fourth in the midwest.

Your rank will not affect the treatment you get in the redistribution center. Whether you are an officer or an enlisted man, you will have a roommate, and you will get the same food, the same accommodations and the same attention from personnel officers as your superiors and inferiors.

Your program will be planned for you, but ample time will be left for pursuits of your own choosing. You will be urged to enjoy your time in this station. The personnel officers want to see you under the best possible conditions. They want you to be in a good frame of mind. They want to separate you from a barracks atmosphere.

Without hurry or bustle, they will give you orientation talks and interview you. There will be no punch-card system to find your slot, no heads-you-go-here, tails-you-go-there. You (Continued on Page 8)





will be an individual as well as a soldier, with problems and preferences and skills and shortcomings.

It may develop, of course, that the personnel officers will decide you still aren't ready for a new assignment. Perhaps you are more fatigued than you yourself realized.

In that event you will not be sent directly from the redistribution station to your new assignment. If you appear to be a severe fatigue case, you will be sent to a convalescent center. But more likely, you will go to a rest camp, an AAF station set up for the kind of recreation and relaxation that will condition you for a new job.

**THE** returnees who go to rest camps aren't patients. They don't receive treatment, as such. But they do go fishing, play golf, swim, get a lot of sun and a lot of exercise. How long a man stays depends upon his condition and how

quickly he responds to the good life he lives.

Two rest camps are in operation, one at Lake Lure, N. C., and another at Castle Hot Springs, Ariz. A third will be established in the midwest and a fourth on the west coast.

From the rest camps and convalescent centers alike, returnees funnel back through the redistribution station. That applies to men who go to the convalescent center directly from the port of debarkation as well as those who are assigned to the center from a redistribution station.

As another important part of the redistribution program, plans are being made to help find jobs for men who are discharged for physical disability. Personnel officers are coordinating this program with other organizations engaged in such activities—the War Manpower Commission, the Selective Service System, the U. S. Employment Service and the Red Cross.

The AAF is in position to know—and to recommend to prospective employers the kind of industrial job that would utilize the training an individual has had in service or in a convalescent center. As a preliminary step in making certain that such training is utilized, the redistribution organization is preparing a manual to show specifically the list of jobs for which each type of AAF service could be expected to qualify a man.

The redistribution system is set up to handle the gradually increasing load of returnees from overseas. Obviously, it would not be equipped to handle a greatly increased load with such thoroughness. The program, therefore, must remain flexible.

The post-war problem, when the load will reach flood proportions, is another matter. It is expected that the AAF redistribution system will help to point the way toward solution of personnel problems when the day of victory comes. ☆

**O**NE HUNDRED AND THIRTY-TWO hours of combat evacuation flying in North Africa convinced me that the psychological effect of the presence of an American nurse on duty in actual flight is sometimes just as important to our wounded men as her attention to their physical comforts.

During the two months I served with our Evacuation Squadron as a flight nurse we flew an evacuation mission a day, sometimes totalling 87 hours a month. My chief job was to see that the wounded men—usually eighteen patients to a plane—were made as comfortable as possible in the flight from front lines to base hospital. This meant giving medications and hypodermics to ease pain, reinforcing bandages, administering oxygen and blood plasma when needed, or just handing out some rations to patients who were hungry.

But in those planes, thousands of feet above the earth, I found that a nurse can have a definite morale effect on these men, and therein lies perhaps the hardest part of our jobs. Each patient requires individual attention. Many of them are seriously wounded and are suffering from those first few hours or days of shock. They have not yet had time to adjust themselves to their handicaps. In many cases this state of extreme sensitivity on their part calls for all the tact and understanding a flight nurse can give them.

One of the boys may be bursting to tell you how he got his leg shot off. Just telling his story to someone who will listen seems to have a real therapeutic value. He gets it off his chest, every little detail, and then he seems to feel better. And very often, I've found they tell you things they probably wouldn't mention to their own buddies.

## FLIGHT NURSE

By Lieut. Henrietta Richardson



On the other hand, on the same ship you might have another patient who doesn't even want you to mention his wounds or how he got them. He just won't discuss it—or anything. So you learn when to try to cheer up people, and when to keep your mouth shut.

Most of them just want you to listen to them. You should see their eyes light up when they see an American girl on the plane. "Gosh," they exclaim, "a nurse! And on an airplane." They seem to think it really quite wonderful. They

fire questions at you. How long have you been over here? Where do you come from? Do you know so-and-so there?

Here, when they need her most, is an American girl to talk to. For the short duration of that flight, any flight nurse for the moment is mother-sister-wife and the girl-they-left-behind, all in one. They want to tell you everything—what that girl looked like (and if they're lucky enough to still have her picture they'll drag out an old, worn wallet and show you her photo, or maybe it's a snapshot of the young son they haven't seen), or they talk about that job they had in Oregon before the war, or that big time one night down in "San Antone."

Chiefly, they want to know how soon they can get back in action. Even the most seriously wounded want to get back for another crack at the Nazis. One curly-haired kid we brought to Oran one day had lost his leg in a B-26 gun turret. All during the flight he kept talking about going back to the States, getting fixed up with an artificial leg so he could come back and fly in that B-26 again.

The one thing you never hear from any of these men is one word of complaint. You ask them if they need anything, but you practically have to beat them over the head before they'll admit they would feel better with a dressing changed. "I'm all right," they will say. "Maybe somebody else wants something." ☆

### PICTURE CREDITS

FIRST, THIRD AND FOURTH COVERS: AIR FORCE Editorial Office staff photos. 22-23: Acme News-pictures. 28-29: AIR FORCE STAFF and AAF. 30-31-32: Office of Flying Safety. 35: Roger's Studio, New Haven, Conn. 44-45: AAF First Motion Picture Unit. 51: Boeing Aircraft. All other photographs secured through official Army Air Forces sources.



By **LIEUT. COL. BEIRNE LAY, JR.**

**8TH AIR FORCE**

# MISSION

**T**HIS report does not attempt to render a complete summary of the mission. It is merely an eyewitness account of an ordeal in which our group fought its way through fierce and prolonged enemy fighter attacks and accurately bombed a vital target.

When our group crossed the coast of Holland at our base altitude of 17,000 feet, I was well situated to watch the proceedings, being co-pilot in the lead ship of the last element of the high squadron. With all of its 21 B-17Fs tucked in tightly, our group was within handy supporting distance of another group, ahead of us at 18,000 feet. We were the last and lowest of the seven groups that were visible ahead on a southeast course, forming a long chain in the bright sunlight—too long, it seemed. Wide gaps separated the three combat wings.

As I sat there in the tail-end element of that many miles long procession, gauging the distance to the lead group, I had the lonesome foreboding that might come to the last man about to run a gauntlet lined with spiked clubs. The premonition was well founded.

Near Woensdrecht, I saw the first flak blossom out in our vicinity, light and inaccurate. A few minutes later, two FW-190s appeared at one o'clock level and whizzed through the formation ahead of us in a frontal attack, nicking two B-17s

*(On August 17 heavy bombers of the 8th Air Force carried out a double-edged attack against the German roller bearing works at Schweinfurt and the Messerschmitt plant at Regensburg. Despite what was termed the "greatest daylight aerial battle in history," targets were bombed successfully. Our losses have been estimated at 59 B-17s, against an enemy loss of 308 fighter planes. This is the report of a co-pilot on the mission, as it was submitted to his CO, with only a few deletions for security.—THE EDITOR)*

Illustrated by Capt. Raymond Creekmore

in the wings and breaking away beneath us in half-rolls. Smoke immediately trailed from both B-17s, but they held their stations. As the fighters passed us at a high rate of closure, the guns of our group went into action. The pungent smell of burnt powder filled our cockpit, and the B-17 trembled to the recoil of nose and ball turret guns. I saw pieces fly off the wing of one of the fighters before they passed from view.

Here was early action. The members of the crew sensed trouble. There was something desperate about the way those two fighters came in fast, right out of their climb without any preliminaries. For a few seconds the interphone was busy with admonitions: "Lead 'em more . . . short

bursts . . . don't throw rounds away . . . there'll be more along in a minute."

Three minutes later, the gunners reported fighters climbing up from all around the clock, singly and in pairs, both FW-190s and ME-109Gs. This was only my fourth raid, but from what I could see on my side, it looked like too many fighters for sound health. A coordinated attack followed, with the head-on fighters coming in from slightly above, the nine and three o'clock attackers approaching from about level, and the rear attackers from slightly below. Every gun from every B-17 in our group and the one ahead was firing, criss-crossing our patch of sky with tracers to match the time-fuze cannon shell puffs that squirted from the wings of the Jerry single-seaters. I would estimate that 75 percent of our fire was inaccurate, falling astern of the target—particularly the fire from hand-held guns. Nevertheless, both sides got hurt in this clash with two B-17s from our low squadron and one other falling out of formation on fire with crews bailing out, and several fighters heading for the deck in flames or with their pilots lingering behind under dirty yellow parachutes. Our group leader pulled us up nearer to the group ahead for mutual support.

I knew that we were already in a lively fight. What I didn't know was that the real fight, the *anschluss* of Luftwaffe

20 mm cannon shells, hadn't really begun. A few minutes later, we absorbed the first wave of a hailstorm of individual fighter attacks that were to engulf us clear to the target. The ensuing action was so rapid and varied that I cannot give a chronological account of it. Instead, I will attempt a fragmentary report, salient details that even now give me a dry mouth and an unpleasant sensation in the stomach when I recall them. The sight was fantastic and surpassed fiction.

It was over Eupen that I looked out of my co-pilot's window after a short lull and saw two whole squadrons, twelve ME-109s and eleven FW-190s climbing parallel to us. The first squadron had reached our level and was pulling ahead

came hurtling through the formation, barely missing several props. It was a man, clapping his knees to his head, revolving like a diver in a triple somersault. I didn't see his chute open.

A B-17 turned gradually out of the formation to the right, maintaining altitude. In a split second, the B-17 completely disappeared in a brilliant explosion, from which the only remains were four small balls of fire, the fuel tanks, which were quickly consumed as they fell earthward.

Our airplane was endangered by hunks of debris. Emergency hatches, exit doors, prematurely opened parachutes, bodies and assorted fragments of B-17s and Hun fighters breezed past us in the slip stream.

I watched two fighters explode not far below, disappearing in sheets of orange flame, B-17s dropping out in every stage of distress, from engines on fire to control surfaces shot away, friendly and enemy parachutes floating down and, on the green carpet far behind us, numerous funereal pyres of smoke from fallen fighters, marking our trail.

On we flew through the strewn wake of a desperate air battle, where disintegrating aircraft were commonplace and sixty chutes in the air at one time were hardly worth a second look.

**I WATCHED** a B-17 turn slowly out to the right with its cockpit a mass of flames. The co-pilot crawled out of his window, held on with one hand, reached back for his chute, buckled it on, let go and was whisked back into the horizontal stabilizer. I believe the impact killed him. His chute didn't open.

Ten minutes, twenty minutes, thirty minutes, and still no let up in the attacks. The fighters queued up like a breadline and let us have it. Each second of time had a cannon shell in it. The strain of being a clay duck in the wrong end of that aerial shooting gallery became almost intolerable as the minutes accumulated toward the first hour.

Our B-17 shook steadily with the fire of its fifties and the air inside was heavy with smoke. It was cold in the cockpit, but when I looked across at our pilot—and a good one—sweat was pouring off his forehead and over his oxygen mask. He turned the controls over to me for a while. It was a blessed relief to concentrate on holding station in formation instead of watching those everlasting fighters boring in. It was possible to



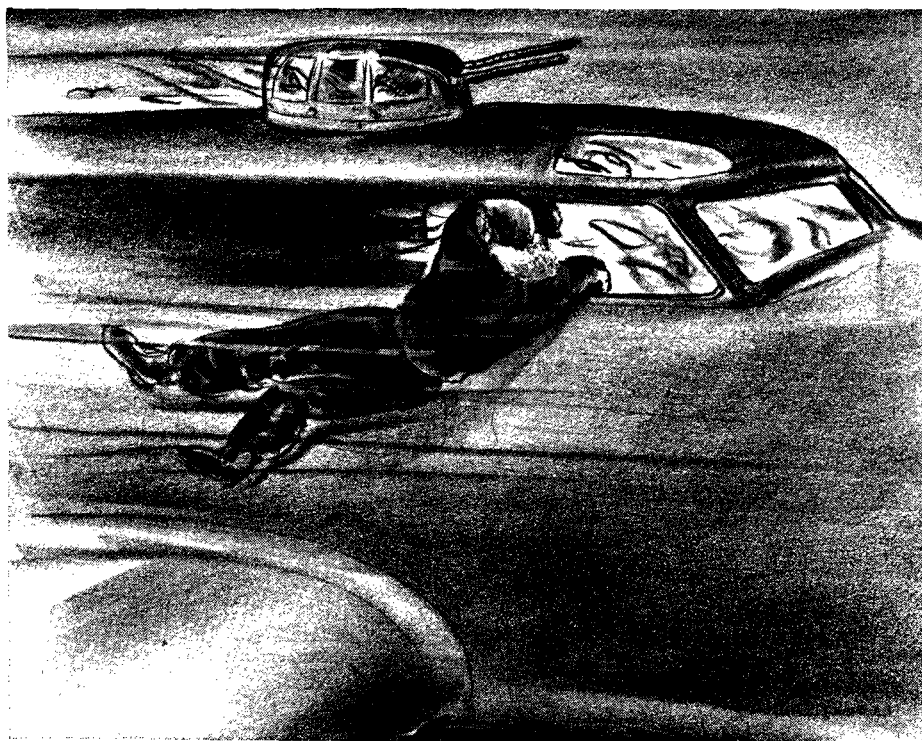
"The first squadron had reached our level . . ."

to turn into us and the second was not far behind. Several thousand feet below us were many more fighters, with their noses cocked at maximum climb. Over the interphone came reports of an equal number of enemy aircraft deploying on the other side. For the first time, I noticed an ME-110 sitting out of range on our right. He was to stay with us all the way to the target, apparently reporting our position to fresh squadrons waiting for us down the road. At the sight of all these fighters, I had the distinct feeling of being trapped—that the Hun was tipped off, or at least had guessed our destination and was waiting for us. No P-47s were visible. The life expectancy of our group suddenly seemed very short, since it had already appeared that the fighters were passing up preceding groups, with the exception of one, in order to take a cut at us.

Swinging their yellow noses around in a wide U-turn, the twelve-ship squadron of ME-109s came in from twelve to two o'clock in pairs and in fours and the main event was on.

A shining silver object sailed past over our right wing. I recognized it as a main exit door. Seconds later a dark object

". . . reached back for his chute"



forget the fighters. Then the top turret gunner's twin muzzles would pound away a foot above my head, giving an imitation of cannon shells exploding in the cockpit, while I gave an even better imitation of a man jumping six inches out of his seat.

A B-17 ahead of us, with its right Tokyo tanks on fire, dropped back to about 200 feet above our right wing and stayed there while seven of the crew bailed out successively. Four went out the bomb bay and executed delayed jumps, one bailed from the nose, opened his chute prematurely and nearly fouled the tail. Another went out the left waist gun opening, delaying his chute opening for a safe interval. The tail gunner dropped out of his hatch, apparently pulling the ripcord before he was clear of the ship. His chute opened instantaneously,

long since mentally accepted the fact of death and that it was simply a question of the next second or the next minute. I learned firsthand that a man can resign himself to the certainty of death without becoming panicky. Our group firepower was reduced 33 percent, ammunition was running low. Our tail guns had to be replenished from another gun station. Gunners were becoming exhausted and nerve-tortured from the prolonged strain, and there was an awareness on everybody's part that something must have gone wrong. We had been the aiming point for what seemed like most of the Luftwaffe and we fully expected to find the rest of it primed for us at the target.

Fighter tactics were running fairly true to form. Frontal attackers hit the low squadron and lead squadron, while rear

in some cases, actually pulling up instead of going down and out. Several FW pilots pulled off some first rate deflection shooting on side attacks against the high group, then raked the low group on the breakaway out of a side-slip, keeping the nose cocked up in the turn to prolong the period the formation was in their sights.

I observed what I believe was an attempt at air-to-air bombing, although I didn't see the bombs dropped. A patch of 75 to 100 grey-white bursts, smaller than flak bursts, appeared simultaneously at our level, off to one side.

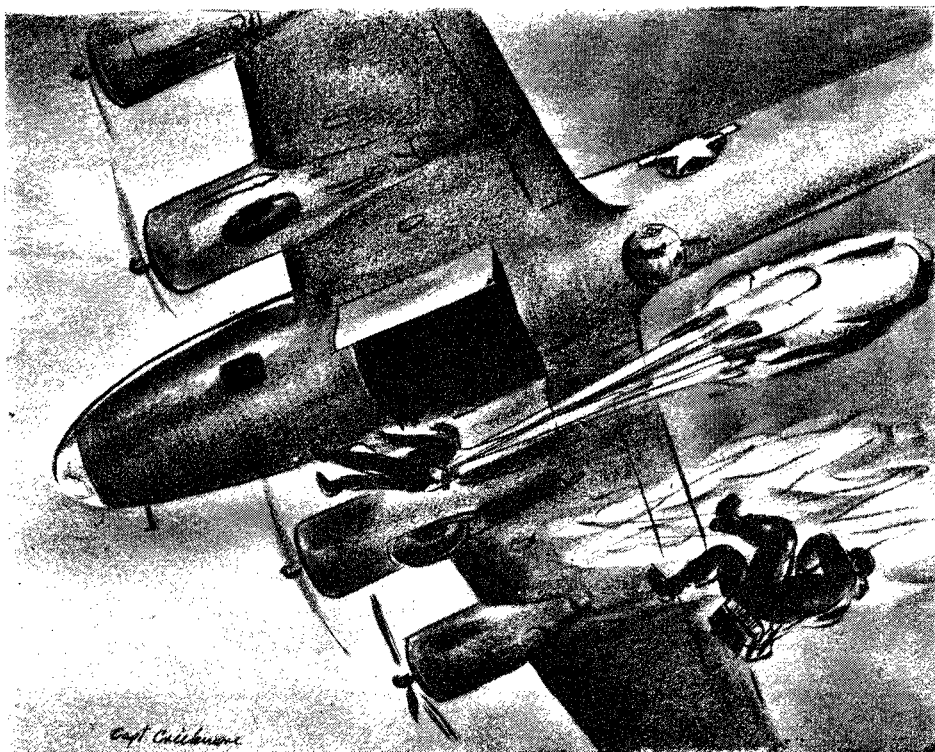
One B-17 dropped out on fire and put its wheels down while the crew bailed. Three ME-109s circled it closely, but held their fire, apparently ensuring that no one stayed in the ship to try for home. I saw Hun fighters hold their fire even when being shot at by a B-17 from which the crew was bailing out.

Near the I.P., one hour and a half after the first of at least 200 individual fighter attacks, the pressure eased off, although hostiles were nearby. We turned at the I.P. with fourteen B-17s left, two of which were badly crippled. They dropped out after bombing the target and headed for Switzerland. The No. 4 engine on one of them was afire but the plane was not out of control. The leader of the high squadron received a cannon shell in his No. 3 engine just before the start of the bombing run and went in to the target with the prop feathered.

Weather over the target, as on the entire trip, was ideal. Flak was negligible. The group got its bombs away promptly on the leader. As we turned and headed for the Alps, I got a grim satisfaction out of seeing a column of smoke rising straight up from the ME-109 shops, with only one burst over in the town of Regensburg.

The rest of the trip was a marked anticlimax. A few more fighters pecked at us on the way to the Alps. A town in the Brenner Pass tossed up a lone burst of futile flak. We circled the air division over Lake Garda long enough to give the cripples a chance to join the family, and we were on our way toward the Mediterranean in a gradual descent. About 25 fighters on the ground at Verona stayed on the ground. The prospect of ditching as we approached Bone, short of fuel, and the sight of other B-17s falling into the drink, seemed trivial matters after the nightmare of the long trip across southern Germany. We felt the reaction of men who had not expected to see another sunset.

At dusk, with red lights showing on all of the fuel tanks in my ship, the seven B-17s of the group still in formation circled over Bertoux and landed in the dust. Our crew was unscratched. Sole damage to the airplane: a bit of ventilation around the tail from flak and 20 mm shells. We slept on the hard ground under the wings of our B-17, but the good earth felt softer than a silk pillow. ☆



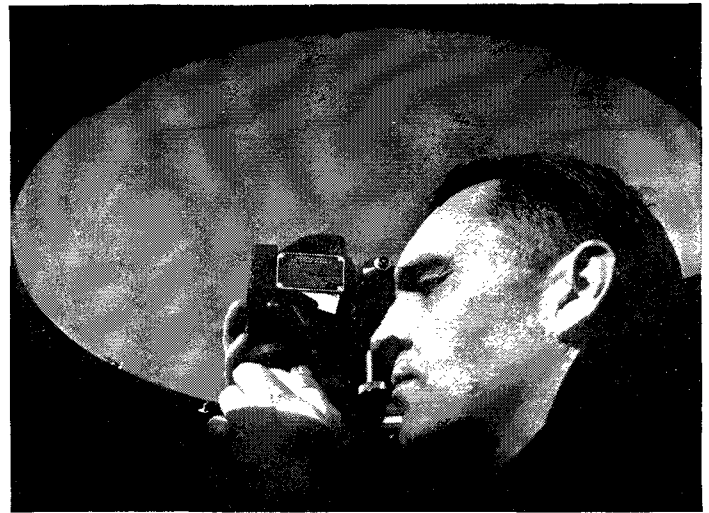
"... one bailed from the nose, opened his chute prematurely"

barely missing the tail, and jerked him so hard that both his shoes came off. He hung limply in the harness, whereas the others had showed immediately some signs of life after their chutes opened, shifting around in the harness. The B-17 then dropped back in a medium spiral, and I did not see the pilots leave. I saw it just before it passed from view, several thousand feet below us, with its right wing a solid sheet of yellow flame.

After we had been under constant attack for a solid hour, it appeared certain that our group was faced with annihilation. Seven had been shot down, the sky was still mottled with rising fighters and target-time still 35 minutes away. I doubt if a man in the group visualized the possibility of our getting much farther without 100 percent loss. I know that I had

attackers went for the high. The manner of their attacks showed that some pilots were old-timers, some amateurs, and that all knew pretty definitely where we were going and were inspired with a fanatical determination to stop us before we got there. The old-timers came in on frontal attacks with a noticeably slower rate of closure, apparently throttled back, obtaining greater accuracy than those that bolted through us wide out. They did some nice shooting at ranges of 500 or more yards, and in many cases seemed able to time their thrusts to catch the top and ball turret gunners engaged with rear and side attacks. Less experienced pilots were pressing attacks home to 250 yards and less to get hits, offering point-blank targets on the breakaway, firing long bursts of twenty seconds, and,





Proper position for the head and sextant in the spherical astro-dome is demonstrated (left) by Colonel Thurlow. This position allows for a minimum of refraction error. At right is shown the correct position as viewed from inside the plane.

*By Col. Thomas L. Thurlow*

CHIEF, INSTRUMENT AND NAVIGATION UNIT, WRIGHT FIELD

NAVIGATION of the skyways has presented many problems in the short period of its existence. Most of them, however, have been solved by years of engineering and design and the introduction of "miracle gadgets" that have made possible our globe-girdling flights and operations.

Yet one drawback has been the human element—the proper use of navigational devices that go into present day aircraft. Currently we are faced with a problem regarding the use of the astro-dome in the navigator's compartment of medium and heavy bombers and cargo transports.

The spherical dome in use today is as near perfect as a dome can be, yet there are many navigators who will not trust celestial observations taken through it. This dome has several marked advantages over other types and therefore should be understood and used to the full extent of its capabilities.

Navigators are concerned with the passage of light through glass (or plastic) with parallel surfaces and through glass with wedged surfaces. A ray of light passing through "parall" glass or plastic executes a "jog" when cutting the substance, but its initial and final directions in space remain the same. The ray is displaced but it is not deviated and no error results. This is illustrated in *Figure 1A*. When a ray of light passes through wedged glass or plastic it is both displaced and deviated, as shown in *Figure 1B*. The deviation in this latter case causes an error in the observation.

Vision through a perfect spherical dome

will be distorted unless the light rays which afford vision are collected at the center of the sphere by the eye, if scanning, or by the rotating sextant prism if observing.

WHEN the newcomer looks through the standard spherical dome now fitted to several types of AAF airplanes and discovers—to his amazement and worry—that the dome distorts his vision he immediately (and unwisely) condemns it. He is looking through an ever-varying wedge as he surveys surroundings through the dome and naturally there is a varying, noticeable distortion of the objects viewed. However, an important consideration is generally overlooked in such hasty condemnation. Light from a celestial body enters the dome in parallel rays. The only part of the light from a particular celestial body that a navigator can use is the small bundle of parallel rays that his eye receives—a bundle with a diameter equal to the diameter of the pupil of his sighting eye. During any one observation then, the navigator is using only a very small portion of the dome. To judge properly the quality of the dome, the whole of it except this small, pupil-size spot, should be rendered opaque. Then both deviation and distortion are so difficult to detect that they cannot be seen with the naked eye and must be measured with laboratory instruments.

Aerodynamic considerations demand that the navigator's dome be small. A full hemisphere cannot be tolerated and, as a result, a segment of a sphere has to

suffice. The standard observing dome is a six-inch segment of an eleven-inch sphere. Several considerations influenced the selection of this particular sphere, and it is considered a very reasonable compromise.

Although the navigator uses only a small (pupil-size) area of the dome when making an observation, the surfaces of the area are "wedged." The amount of wedge varies with the measured altitude and with the position of the sextant. The effect of this positional error of the sextant and the reason for the existence of the wedge is illustrated in *Figure 2*. When the sextant is held quite close to the dome, the wedge effect—and hence the deviation—may become excessive. When it is held farther away, the wedge effect is generally reduced. These two conditions also are illustrated in *Figure 2*.

If the sextant is held in a fixed position with respect to the axis or to the flange of the dome, the refraction error will vary only as the measured altitude varies and can be allowed for. If this fixed sextant position is well away from the surface of the dome, the error will be at a minimum. To keep the dome shallow, and thereby aerodynamically "clean," it was designed to be used with horizontal line of sight sextants such as the A-10 and the new AN instrument. These instruments are now delivered with a support arm in the carrying case. The support arm can be attached to the metal fitting at the top of the dome with a standard aircraft bolt. The sextant incorporates an eye that permits it to be supported by the shock-mounted hook of the support arm. Thus,

the sextant is both supported and POSITIONED by the support arm. When the sextant is so positioned, the refraction varies only with the measured altitude. The following corrections are to be applied to the altitude measured:

Sextant Altitude	Correction
10 .....	—2
20 .....	—3
30 .....	—4
40 .....	—4
50 .....	—4
60 .....	—4
70 .....	—4
80 .....	—4

The quality of the standard dome is such that the above corrections should never vary more than two minutes of arc from dome to dome. This maximum variation is the price the navigator pays for complete sky coverage with a simple and light dome installation.

Some navigators claim fantastic refraction errors of one or two degrees. If errors differing more than a few minutes from those listed in the above table are encountered, they are due entirely to the position of the sextant in the dome. No such errors are possible when the support arm is used.

Although the support arm is a distinct aid and is strongly recommended, it is not an indispensable item of equipment. The sextant can be held easily in almost the exact position in which the arm supports it after one or two trials.

# **Every navigator should understand the operation of the astro-dome and learn to employ it correctly.**

The support arm for the A-10 sextant and that for the AN sextant are designed to position the rotating prism of the sextant approximately one inch above the flange of the dome and slightly less than three inches from its axis, in the direction of the body being observed. When the sextant is in the position the observer's eye is slightly below the dome flange and the back of his head clears the dome by more than an inch.

The mounting holes in the flange of the dome are slotted to allow the dome to expand or contract with temperature changes. Therefore, care should be taken that the hold-down bolts are not pulled up too tightly. If the dome is distorted for this reason, serious refraction errors may result. Aircraft manufacturers apparently fail to take this into account, so the navigator should check this matter personally.

If the navigator does not have a support arm, he should learn to position his sextant correctly by practicing the following drill a few times. This drill applies only when using the A-10 and the AN sextants:

Set the sextant for zero degrees altitude. Make a horizontal mark on the dome one inch above the flange.

Lower or raise the head in the dome until the horizontal mark on the dome when seen through the instrument bisects the field of view (or bisects the

bubble if the dome is level). If the dome is not level take care that the vertical axis of the sextant is parallel to the axis of the dome.

Lean back until the head touches the dome, and then forward slightly for comfortable head clearance.

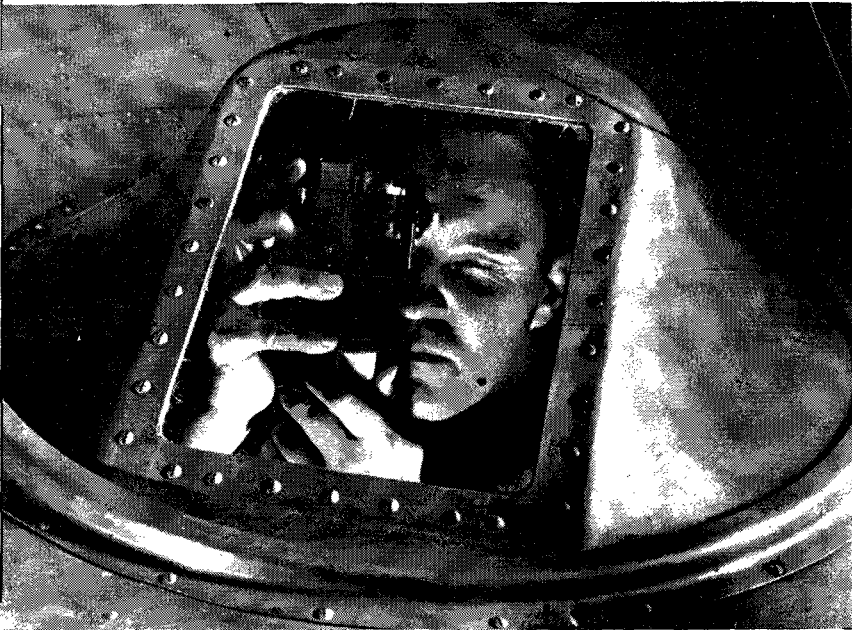
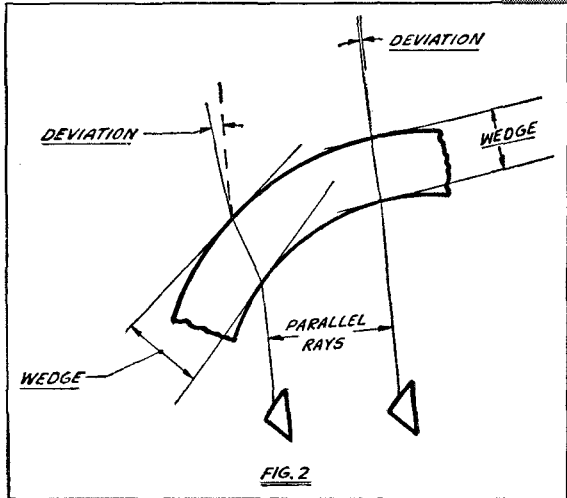
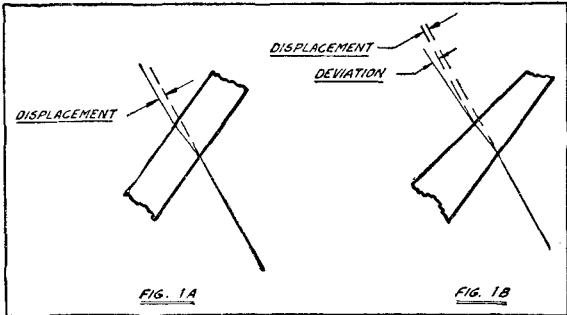
If the observer is sighting straight across the dome, that is, if he is not leaning to right or left, the sextant is being held correctly and the dome refraction errors of the foregoing table apply.

The standard spherical dome is not of sufficient height to permit the use of "down-sighting" sextants such as the A-5 and the A-7 instruments, or the A-6 and A-8 instruments when they are not being used for direct viewing of the body being observed.

Many navigators prefer the A-6, A-8 (Bausch and Lomb) and the A-12 (Link) sextants used as direct viewing instruments. When using these there is but one rule to observe: *Position the head so that the line of sight is perpendicular to the surface of that portion of the dome being used.*

This rule cannot be complied with when the altitude of the body observed is less than twenty degrees, and a correction of two minutes of arc should be applied to the measured altitude. Above twenty degrees, if the head is positioned in accordance with the above rule, no dome refraction correction need be applied.

The navigator should make every attempt to understand the operation of the astro-dome and to use it correctly before criticizing it. He should bear in mind that it required years of insistent persuasion to convince the aerodynamists and those concerned with aircraft performance that a sacrifice to help the navigator was necessary. The same people will be quite willing to remove the dome if the navigators themselves condemn it. ☆





# OUR DEVELOPMENTS IN **FIREPOWER**

By **COL. FRANK C. WOLFE**  
CHIEF, ARMAMENT LABORATORY, MATERIEL COMMAND

- Combination gunsights and dive bombsights.
- Personnel flak suits and armored helmets.
- Improvements in armor plate and bullet-resistant glass.
- Improvements in the gunsight aiming-point camera.

THE firepower problem is not new. Arming of aircraft dates back to the days at College Park, Md., in 1909 when the Wright brothers were training our first military aviators—among them today's Commanding General of the Army Air Forces, General Henry H. Arnold. There the first machine gun, carried in the lap of a passenger, was fired at a ground target from a flying machine. Crudely fashioned bombs also were taken aloft and dropped on targets.

Subsequent steps in converting the airplane into an effective military weapon were made during the first World War when Germans and Allies introduced new methods of fitting their planes with machine guns and bombs. As early as 1915 German observers flying over Paris fired rifles at French aircraft in the air. The French retaliated with automatic rifles. Later, machine guns mounted on the wing, shooting over the propeller, and located at various other positions on the airplane, were introduced. Next, guns were synchronized to fire through the propeller. From then on, Germans and Allies increased the firepower of their aircraft. The French used the first cannon, a 37 mm Hotchkiss, on the Voisin airplane. Guynemer, the French ace, used a similar cannon, firing through the propeller shaft of a Hispano engine, in a SPAD plane. It proved effective against aircraft and balloons. Leak-proof gasoline tanks and armor plate came too late—the war was over before much could be done about their practical application.

Records of these actions were shelved in War Department files until preparation for the current war brought them out

again. Although aircraft were faster and more maneuverable when war came to the world in September, 1939, it caught American warplanes with their flaps down. Armament had not kept pace.

The few fighting planes that we had at that time were woefully lacking in needed firepower. Some of our fighter types had only one .30 caliber gun and one .50 caliber gun mounted side by side, firing through the propeller. These ships became obsolete overnight when World War II ushered in the era of the "flying gun platform." Yet, we had powerful bombers and speedy fighters "in the works."

Today, these ships and other aircraft of the Army Air Forces are carrying heavy firepower to the enemy.

Creating this sting, while adapting idea changes from the operational theatres, is the task for armament personnel of the Air Forces; more specifically, the job for the Materiel Command's Engineering Division Armament Laboratory at Wright Field.

War greatly accelerated the laboratory's job. Once a small, three-room office buried in the midst of hangars and shops at Wright Field, this laboratory was fed millions-of dollars for experimental purposes and expanded into the largest aeronautical armament research center in the world.

In an effort to maintain superiority over enemy developments in firepower, our armament laboratory is continually working toward modernization or improvement of aircraft installations now being used in combat.

Aircraft fire control is a new art. This war's trend toward a battlefield in the stratosphere has spawned heretofore untried types of aircraft armament. One solution is the use of remote fire control systems which remove the gunner from the proximity of his guns, diminishing the effects of vibration on the sighting operation and allowing for greater comfort and less fatigue for the gunner.

COMBAT experience has necessitated the re-arming of our fighting planes. The trend is toward new and significant developments in firepower, and our accomplishments are making American fighting planes the most formidably armed aircraft in the skies.

Our recent firepower development, as much of it as we can discuss at this time, includes:

- Heavier caliber machine guns.
- Heavier millimeter rapid-fire cannon.
- Hydraulic and electrically operated gun turrets with multiple gun installations.
- Remotely controlled and power-booster and hand-held machine gun mounts.
- Remote control and fire control systems.
- Increased firepower for nose and tail positions of all types of bombers.
- Power-driven nose turrets in heavy bombers.
- Interchangeable nose turrets for a light bomber type.
- Multiple 37 mm cannon mounts in bombers for forward fire.
- Multiple gun turrets for night fighters.
- Forward-firing fixed 20 mm cannon in a light bomber type.
- Fixed gun installation for fighter aircraft to provide automatic corrections for lead, range, altitudes and speed.
- Improved computing sights for all gun positions.
- Emphasis on placement of guns to assure maximum protection.
- Fighter gunsights which extend present sighting ranges.

Paralleling the development of these remote control systems, high priority is being given to heavier caliber guns and cannon for such installations.

Great advancement has been made in the application of heavy caliber cannon for fighter offensive use and as defensive installations in bombers. Much stress has been placed on power-driven turrets for all sizes of machine guns and cannon. Such installations include locally operated, remotely controlled and power-boosted hand-held mounts. The latter are vast improvements over original single hand-held flexible guns inasmuch as larger caliber, multiple weapons can be more accurately controlled and sighted free from slipstream effect encountered at high speeds. These installations and their continued improvement have done a great deal toward commanding respect from enemy fighters.

For example, just after Pearl Harbor, the Japs found B-17s without tail guns easy prey, and accounted for several of the bombers by rear attacks. Two .50 caliber guns were installed in the B-17 tail and on one particular flight (the first time the new guns were used in combat), the tail gunner of one Fortress shot down seven Jap fighter planes.

These early installations have been improved so that today tail gunners have more firepower and, in some cases, turrets have replaced the flexible guns. This increases effectiveness since turret fire is more accurate than the hand-held gun with its excessive vibration.

We have been fortunate in having a wide size range in aircraft weapons—from the small .30 caliber machine gun, capable of firing 1,200 rounds per minute and weighing less than 25 pounds, to the larger cannon which fires at a much slower rate. However, American firepower today is relying on the .50 caliber machine gun. It is the weapon most commonly employed in our aircraft.

This gun, hailed as the finest arm of its kind in the world, weighs approximately 65 pounds, and is capable of firing 800 rounds per minute. Relatively small in size, it fits easily into all of our aircraft types. The projectile leaving the muzzle at a speed of over 2,900 feet per second can penetrate any kind and all parts of an airplane. And the shell is small enough for as many as 1,000 rounds per gun to be carried. During one test the .50 caliber was fired at an obsolete bomber fuselage. It smashed the bomber's skin, ammunition boxes, a longeron, a hard pine board and then pierced a 7/16-inch piece of armor plate.

The .50 caliber gun has an effective range of four miles and from that distance still packs sufficient wallop to kill a man. Another measure of its force can be brought out when it is estimated that bullets from the eight guns on a Republic P-47 firing together deliver to an enemy target more horsepower punch than the 2,000 hp engine which pulls the ship through the air.

THE number of guns carried in an airplane depends largely on the airplane's configuration. In bomber types the guns usually are mounted in pairs which are disposed from nose to tail to afford protection from every conceivable direction of attack. In fighter types the number of guns varies from four to eight.

By comparison, a flight of thirteen Republic Thunderbolts, each with eight .50 caliber guns, has three times the striking power of a machine gun unit of a German infantry regiment. A formation of thirteen bombers, carrying a new heavy millimeter cannon now going on some of the medium types, carries twice the firepower of the 75 Howitzer used by the Nazi regiment. A single flight of thirteen Airacobras, carrying .37 mm cannon, is equal to the anti-tank guns of the regiment.

Downing an airplane with gun fire is not simple; it is difficult to keep a fast moving target in range. This means that

**"We are designing guns  
and putting wings on them."**

Machine guns fire from 600 to 1,200 rounds of ammunition per minute, depending upon the type of gun, caliber, temperature, synchronization and the design and location of all accessories such as feed chutes, ammo boxes and means of ejection. However, rate of fire must not be over-emphasized. Guns are rarely fired in long bursts. In air combat a pilot seldom holds his trigger for bursts that exceed 25 rounds. If fire duration is exceeded, guns will become overheated and unintentional firing, damaged barrels and other serious malfunctions will result.

What constitutes adequate firepower for modern aircraft frequently becomes the object of discussion among those not familiar with this all-important factor in air warfare. The mere presence of numbers of guns or cannon, irrespective of caliber, is not indicative of true firepower. Each airplane must of necessity be treated separately during its initial design when every conceivable consideration is given to the number of weapons, their caliber and, above all, their placement in the aircraft to assure maximum protection.



This small movie camera in the nose of a P-38 is used as an aid in improving firing accuracy. Visible in the photo above are three .50 caliber machine guns and one 20 mm cannon.

a gunner must fire more rounds in a given time interval to assure a hit on a speeding airplane. In one sense the perfection of the machinery provided the gunner can be considered a measure of his firepower. If each time the gunner squeezed the trigger he could be assured a hit, obviously one gun would be adequate. However, because of the complications involved—the ballistic behavior induced when a projectile is fired from an airplane, the human element, and the speed and maneuverability of the airplane target—aerial gunnery is a complicated procedure.

Our bombers for some time have been using computing sights which have forced enemy fighters to remain at a range from which their firepower is ineffective. These computing sights continually are being improved. The problems involved in correcting completely for aircraft gun-laying are many and, to obtain hits, they must be solved to a fine degree of accuracy. These solutions include accurate and instantaneous computation of and correction for lead and ballistic variations caused by altitude, range and speed of the firing airplanes. In fact, the corrections obtained through use of computers parallel those of the secret bombsight, but ac-

tually involve a greater number of factors which must be solved with even less assistance from the gunner.

In the last war the ordinary ring and bead sight was used as standard for all aircraft guns. Now the ring and bead sight is used only on hand-held guns. Reflector sights eliminate the need for lining up the gunner's eye and front and rear sights with the target since the sight itself actually projects a sight reticle image onto a transparent reflector plate which, at infinity, moves with the gunner's eye. Thus, although the gunner's head may be in continual movement in rough air, the sight line and target remain together.

Although the use of computing sights thus far has been limited to turrets, additional computing sights have been developed and placed in production for use in all other gun positions. A large amount of credit is due the various fire control system manufacturers for their research and development.

The gunsight aiming-point camera is proving highly beneficial in improving the accuracy of our gunners. A small compact camera, carrying 16 mm motion picture film in its magazine, is mounted

Below is a scene in the "torture chamber" of the armament lab at Wright Field, where gun barrels are tested to see how long they can take it. This man fires as many as 8,000 rounds of ammunition a day trying to "burn out" a gun.





behind the gunsight taking a picture of the sight reticle as it is projected on the target. Thus, it is possible to study exactly what the gunner has seen through the gunsight, and evaluations and corrections can be made to improve his aim. Quick-processing film enables this study to be made a few minutes after the gunnery practice—or actual air combat—since some of the cameras have already been employed in battle areas. While the gunner's errors are still fresh in his mind, he can see what should have been done to improve his effectiveness.

Recently, instructors at a gunnery school revealed that before using the gun camera their students scored 22.4 percent hits in ground gunnery and 4.7 percent hits in aerial gunnery, but after they had used the camera and studied their faults, the hit percentage was jumped to 27.5 percent for ground gunnery and 13.5 percent for aerial gunnery. Later, in trying for gunnery records, those trained on the gun camera scored 58.75 percent on

ground gunnery and 59.5 percent for aerial gunnery. Thirty percent of gunners have been rated as experts after being trained in use of this camera.

Two main factors in aerial gunnery determine the accuracy of gun fire following automatic computation — *tracking* and *ranging*. Unless the gunner tracks smoothly and ranges precisely, the computing gunsight will be given inaccurate data on which to base its calculation. Tracking involves keeping the gunsight precisely on the target without deviation, while ranging refers to manipulation of the sight's range-measuring mechanism to keep the correct range constantly in the computer. Both are done in turrets by wrist or feet movements.

The pictorial record of the gunsight aiming camera enables the gunner to see his errors and to make corrections in succeeding trials.

Advancements in aircraft armament over the last four years have necessitated the development of new armament testing

facilities including indoor and outdoor firing ranges, cold rooms for test firing at extremely frigid temperatures, high altitude pressure chambers, sight and computer testing devices and advanced electronic tests. Because our aircraft are fighting in extremely high desert temperatures and extremely low arctic temperatures, it has been necessary to design armament equipment for perfect operation in all climatic and atmospheric conditions. The temperatures under which armament items are tested range from minus 65 degrees to plus 160 degrees Fahrenheit. A recently completed cold test firing room at the Wright Field armament laboratory is proving invaluable in the investigation and testing of all equipment. In the high altitude pressurized chambers, strange phenomena of armament operation are being investigated continually.

From studies of the reaction of guns and their firing mechanisms to cold conditions, researchers have developed new greases and oils that allow smooth opera-

On this large armament range at Wright Field the forward and rearward fire of aircraft are tested. One of the A-20s shown here has been hoisted in the air to simulate a condition of flight in checking on the effects of vibration.



tion of guns at any temperature. They also have studied effects of cold and heat on the thick glass transparencies around windshields and turret installations and developed new types to offset the damaging temperatures.

In another section of the large laboratory is a "torture test" chamber where guns are fired on life tests. Mounted on a large grotesque frame, machine guns and cannon are fired for as many as 8,000 to 10,000 rounds a day to determine life expectancy of gun barrels and to make sure there is no malfunction in the gun mechanism.

Such tests produce innovations in gun design and installation methods. Armament engineers, with the splendid cooperation of Ordnance, have worked out the most efficient guns in existence. In one day this year, patent applications for seven new inventions on a particular gun were sent to Washington from the armament laboratory.

The normal procedure in the development of new items of armament equipment involves the following steps: Re-

quirements are laid down—usually as a result of actual combat requirements which are forwarded to the Materiel Command—and preliminary specifications drawn up by the armament laboratory. These specifications in most cases are submitted to competent fire control manufacturers who conduct the necessary research development, design and fabrication of an experimental article, in collaboration with engineers at Wright Field. When the first article is completed, tests are made by the manufacturer prior to its release to the Materiel Command for further laboratory trials and installation in aircraft for preliminary air-firing. Upon satisfactory completion of this testing, the article is sent to the Army Air Forces Proving Ground Command at Eglin Field where complete functional and tactical suitability tests are carried out. If the article under test meets the requirements, it is recommended for standardization and procurement. This may seem a long drawn-out routine, but actually it is accomplished in a relatively short time, an example being the requirement for the computing

sights for tail and nose positions necessitated by increasing losses of our planes from frontal and rear attacks by the enemy.

**CONVERSION** of the Douglas attack bomber into a night fighter was another example of meeting the demands from the front. For some time the British were using A-20s on intruder raids on the Continent—going over low, skirting between hills and dropping light fragmentation bombs on German airfields and gun installations in France. But this wasn't enough. The British wanted the plane for a fighter as well. They tried different types of gun installations in the nose of the ships. We have followed suit in converting the A-20.

Changes in armament usually mean long, drawn-out conferences behind closed doors—hard, cold fact discussions with experts from the equipment laboratory who tell us how much electrical energy we need for new installations, how much we can get and no more. Gun engineers, crack turret trouble shooters, bomb and bombsight technicians are present. We discuss the whole idea with the men who operate our training schools, teach our bombardiers and gunners. Then, from the aircraft laboratory specialists we learn how much airplane we can cut away for new installations; how much weight we can add here and take off there to keep the airplane aerodynamically stable. Some time is spent with production division men who handle the task of getting needed materials, readying a manufacturer to build the plane we desire and seeing to it that production begins immediately.

After standardization and procurement of new armament equipment, work is continued by the manufacturer and the armament laboratory to improve the article still further.

Indicating the scope of experimental projects concurrently undergoing development and testing by armament experts, there are at present approximately seventy airplanes of different types at Wright and Eglin Fields. In some cases, upon completion of the tests by Eglin Field, the airplane and experimental armament items are flown to a combat zone for further tactical evaluation before they go into actual service. All armament development projects do not originate with tactical organizations. The initiation of a new experimental airplane in most cases calls for a parallel development program on the part of the armament laboratory.

To illustrate how a new airplane may dictate new armament designs, it may be said that plans for the giant Douglas B-19 bomber called for unprecedented turret installations, before the British or any other country turned attention to the power-operated turret. The armament laboratory's task was (Continued on page 56)

Oklahoma City Air Depot workers fasten the final bolts and screws in mounting a new stinger in the nose of a B-24. The glass front pieces are installed after the turret is tightened in place.





# THE MARAUDERS CAME THROUGH

By **COL. SAMUEL E. ANDERSON**

**CO OF A MEDIUM BOMBARDMENT WING IN ENGLAND**

B-26s leave the enemy coast after bombing a Nazi fighter base at Lille, France. Smoke is streaming from the right engine of one of the bombers as a result of flak damage, but the plane returned to base. Another B-26 is discernible near the left engine of the bomber at left.

ON a fine summer afternoon in July, a B-26 formation roared over the English Channel at 12,000 feet toward the railroad marshalling yards at Abbeville, France.

Above the formation hovered a watchful escort of RAF Spitfires, ready to nail the German fighters that already were rising from their bases to meet the attack.

Below the formation was the enemy coast—the hard-shelled rim of Western Europe that must be smashed for full-scale invasion.

And behind the formation were hundreds of hopes, plans and doubts that the Marauders would bomb the target and return—all of them—to base.

For this raid was an experiment. It was the first time that B-26s had been sent across the invasion front at medium altitude. They were traveling at a height within range of not only the heavy flak defenses but also the many light flak emplacements near the target area. They were flying into a territory dotted with Nazi fighter bases that protect the great German industrial areas.

I say there were doubts behind this experiment, because the first one had failed. That was a low-level attack by a B-26 formation two months earlier in

which disastrous casualties were suffered. Regardless of the reasons for the failure of the first experiment, everyone from the pilots down to the last grease-marked mechanic waited in tense expectancy for the results of the new tactics against the Luftwaffe and the heavy German ground defenses.

There were some who even doubted whether the Marauder could operate successfully at any altitude, or under any conditions, in the European theatre. And that attitude was applicable to all types of medium bomber. The RAF had only a handful of Venturas, Bostons and Mitchells, alternately stabbing the Nazi defenses at both medium and low level. Maj. Gen. Ira C. Eaker, commanding the 8th Air Force, Brig. Gen. Robert C. Candee, commanding the 8th Air Support Command, and we of the medium bombardment wing did not agree with this attitude. Today's mission was our attempt to disprove all doubts.

**Some questioned whether B-26s could operate successfully over Western Europe but this experimental raid dispelled all doubt.**

Thus it was that there was considerably more than just the bombing results riding on this formation of B-26s as they opened their bomb bay doors over Abbeville.

We were back at home base an hour later—and we all returned safely. The Spits had taken care of the FW-190s and ME-109s that had attempted to intercept, and, while some of the planes suffered damage from flak, direct hits were avoided by evasive action. A few planes, though heavily damaged, came home without great difficulty. Since that mission, B-26s have come back with one engine shot out, with rudders almost shot off, with flaps and landing gear rendered inoperative—conclusive proof that the B-26 is a tough plane which can take a lot of punishment.

This mission—this experiment—had been highly successful, and as General Candee said after our return, "It's just the beginning of continuous operations to crush the German Air Force."

Within the next two months, taking time out only for extremely bad weather, the Marauders entered into a shuttle relay across the English Channel and North Sea that totaled sixty announced raids, an average of one a day. They flew more than 2,470 sorties with a loss of only



eleven aircraft, and dropped more than 2,800 tons of bombs.

Our objective has been two-fold: first, the destruction of the German fighter force in Western Europe, on the ground and in the air; secondly, the building of a battle-seasoned force to support our ground forces when they invade Europe. Although we rarely have caught the Hun on the ground, we have blasted the airdromes guarding German industry until photo reconnaissance has definitely established that many of the landing fields have been abandoned.

St. Omer, Poix, Tricqueville, Bernay St. Martin, Woensdrecht, Beaumont le Roger, Caen/Carpique, Lille/Nord, Lille/Vendeville, Bryas Sud, Merville, Amiens/Glisy—these Luftwaffe fighter bases have been under continuous attack, and the wearing-down process has shown good results.

**ALTHOUGH** we have given about 75 per cent of our attention to German airdromes, marshalling yards and an occasional industrial target have been on our schedule, too. One of the best jobs of precision bombing ever recorded was the raid on the Le Trait shipyard August 4 when a fairly small formation of B-26s placed their bombs into a target 330 by 650 yards and almost completely destroyed it. Additional hits were scored on a submarine and a tanker in the slips.

The biggest day of operations came in coordination with the "amphibious exercises" held in the English Channel on September 9. That morning we threw our Sunday punch. Our targets were coastal defenses near Boulogne which contained heavy guns ranging up to sixteen-inches. Every fifteen minutes for two hours the Marauders were hammering the gun positions, and the effectiveness of the satura-

tion was apparent not only in the fact that the landing craft in the exercises were not fired on, but also in the Strike photos. One photo showed at least 42 bomb craters in one emplacement containing six guns.

Aside from the obvious conclusion as to what may be expected from the medium bombers supporting a possible invasion of Western Europe, that day offered a perfect example of what may be expected from the combat crews. One of our airdromes was shut in by weather that ordinarily would give pilots a restful morning in their bunks. It was a heavy ground fog about 400 feet thick, with 100-yard ground visibility. But the crews had learned during the briefing that an Allied fleet was approaching the French coast. Although they later learned that it was an "amphibious exercise," it seemed like the real thing at the time.

Up from this fog-bound field shot the Marauders, plowing through the murk until they broke out on top where they formed into boxes and went to Boulogne. In this extremely hazardous take-off only one bomber was lost.

The total for the morning of the "amphibious exercises" was 216 sorties. We lost three, in addition to the one on take-off, which was our heaviest loss on any one mission to date.

Because of magnificent support from RAF Spitfires, which have taken care of nearly all enemy fighters, a medium bomber's biggest worry over Western Europe has been the flak. It comes in big doses, but it isn't nearly as tough as the B-26s and the combat crews who fly through it. However, the proportion of bombers to escorting fighters has risen steadily. The same number of fighters

which escorted the Marauders on their first medium altitude sortie now ordinarily escort many times that number.

Many of the 26s have limped back to base looking like a sieve, and I have lost count of the ones that have come home safely on only one engine. On one occasion, a B-26 piloted by Capt. Donald L. Weiss was badly crippled by flak before it reached the target. Instead of jettisoning his bombs, Captain Weiss decided to make his run over the target on one engine. Losing altitude, he had fallen out of formation, but he fulfilled his mission.

After putting his bombs on the target, Captain Weiss turned again toward England and took evasive action all the way out past the coast—still on one engine.

And there once was a time when people believed the B-26 could not fly on a single engine.

The Marauders raiding Western Europe have had just enough encounters with FW-190s and ME-109s to keep their twelve .50 caliber guns from getting rusty. The few enemy fighters that have slipped through the Spitfire screen have been given a hot reception. Claims against them over a two-month period are ten destroyed, four probables and eleven damaged.

Out of the extremely low loss record of the Marauders and the gradually apparent results of their precision bombing against Nazi airdromes, there has grown in the combat crews a spirit of quiet confidence in themselves and in the ability of their bombers to deliver the goods.

"I wouldn't want to take one home to use after the war as a family airplane," they admit. "But when it comes to combat, I'll take a Marauder every time. It's a hell of a fine fighting airplane." ☆

The B-26s below have blasted fuel dumps, barracks and aircraft shelters at the Merville airdrome, large German fighter base in Western France. Railroad marshalling yards (right) at Serqueux, France, are pounded by bombs dropped by B-26s.



# WINGS FOR THE WOUNDED

*By Lieut. Col. Richard L. Meiling*

OFFICE OF THE AIR SURGEON

THE war had fallen on this Sicilian countryside like a sudden summer rain, then passed on until the battle seemed muted and far away. There was only the throb of a blunt, growing pain for the young American fighter pilot as he lay in a narrow ditch alongside a roadway.

As his mind cleared, the pilot's thoughts raced through the events which led up to his present plight—the enemy shell which had exploded his oxygen system and forced him to bail out, his parachute descent, the tricky wind current that threw him off balance just as he reached the ground, and the violent bump he felt as his leg buckled under him.

His leg was broken and the jagged bone had burst through the flesh. As he struggled to pull himself from the ditch, litter bearers of a medical unit arrived. The two enlisted men lifted him carefully to level ground, stopped the flow of blood and carried him a few hundred yards to a jeep.

Within an hour, the jeep had taken him to an advanced Army Air Forces base where he was placed aboard a C-47 of the Troop Carrier Command which had landed not long before with ammunition and supplies. With its crew had come a flight nurse and a Medical Corps sergeant to attend the evacuees on the return trip.

Other casualties of Sicily joined the wounded airman and, when the transport had taken on its load of patients, they took off for the African mainland. As the C-47 landed at a North African air-drome, a line of ambulances trailed out on the field and took the casualties aboard to move them to a base hospital.

After the injured pilot had undergone treatment for a week, hospital authorities decided he should be removed to the States. With a flight nurse in attendance, the airman and several other patients were flown in a C-54 to Miami and taken immediately to AAF Regional Station Hospital No. 1 at Coral Gables.

The fighter pilot smiled from his hospital bed as he recalled the days he had spent aboard an ocean transport getting to the theatre of operations and the forty-five hours it took to bring him home to the finest medical care.

The case of this American soldier is not unusual. Almost every day patients arrive in the United States aboard the planes of the Air Transport Command

from all parts of the world where our soldiers are fighting. It is a gratifying sight to see these four-engine transports set down at a United States airbase and unload patients who had been evacuated from India and China less than eight days before, and to know they will receive at once the highly specialized medical care that is possible in a modern hospital. It is heartening assurance to any man in the armed service to know that should he become a casualty he can be brought home in a seven or eight-day air voyage rather than experience two months of tiring passage in an ocean convoy.

Maj. Gen. David N. W. Grant, The Air Surgeon, has directed the development of the service which the Army Air Forces have used since Pearl Harbor to evacuate more than 100,000 casualties in every theatre of operations and along every route of the Air Transport Command. Through the air evacuation serv-

**The growth of our Air Evacuation Service which has moved more than 100,000 battle casualties since Pearl Harbor.**

ice, built by General Grant's organization, the lives of many fighting men have been saved. In the Mediterranean theatre alone, as of October 1, more than 25,000 casualties had been flown to base hospitals from the battlefields of Tunisia, Sicily and Italy without accident and with only one death enroute—a tribute to the Troop Carrier Command pilots and crews.

CONSIDER very briefly the military logistics as they are influenced by the use of an organized air evacuation service. It has been estimated that it takes eight and a half tons of supplies initially to maintain one man overseas for the first thirty days, and one and a half tons each month thereafter. The personnel of a 750-bed hospital number 539. Add to this the 750 patients, and multiply the above figures in tons per month, and you can see why the staff officers worry about logistics on the non-effectives. Consider, too, the problem that confronts staff officers in the actual fighting zones. There the roads are limited in number and capacity, and rail lines are either non-existent or consist of a single temporary track. Hospital trains and surface ambulances marked with the Geneva Red Cross can be used only to

transport patients. The fuel, gasoline and oil required by these vehicles must be moved forward to their areas of operation, and since these single purpose vehicles invariably move in the opposite direction to the flow of traffic within the fighting zone, traffic is snarled and the roads and railroad sidings become congested. Air evacuation is the answer to the worried staff officer's prayer. Using the same camouflaged planes that bring troops, supplies and equipment forward (and which, were it not for evacuation, would return empty), and employing cover of a fighter escort when necessary, casualties can be flown hundreds of miles to the rear of the fighting zone. In this manner, hospitals to which patients are evacuated present a minimum of supply and traffic problems to combat commanders.

The more patients who require prolonged hospitalization or rehabilitation that are flown back to the States, the fewer medical facilities are needed and the smaller is the number of ship-tons of supplies required in the theatres of operations to support these non-effectives.

In Africa, Alaska, New Guinea and Sicily, AAF transport planes have been called upon to move entire field hospitals hundreds of miles. In one instance, ten planes were used, and in another forty planes. The remarkable part of this movement is that the hospitals were able to receive patients in their new locations on the day they were flown forward.

In May, 1942, the first airplane ambulance battalion was organized at Fort Benning, Ga., and on Oct. 6, 1942, it was transferred to Bowman Field, Ky., and redesignated as an Air Evacuation Group. The following month further reorganization was effected and the Medical Air Evacuation Transport Squadrons made their debut. On Christmas Day, 1942, the first of these squadrons left Bowman Field for the North African front, were soon followed by other squadrons into the other battle zones, and today they are serving wherever American troops are fighting and along the ATC's world routes.

A brief explanation of the operation methods of these Medical Air Evacuation Transport Squadrons is required to portray the extensive job they are doing. The headquarters and headquarters section has one flight surgeon (the commanding officer), one flight nurse (the chief nurse) and one administrative officer (supply, motor and mess officer), and 32



enlisted men who are clerks, cooks and drivers. There are four flights, each commanded by a flight surgeon, and composed, in addition to the commanding officer, of six nurses, six surgical technicians and two clerks. Each flight is divided into six evacuation teams, and each team is composed of one flight nurse and one staff sergeant.

OPERATING with flexibility to meet the immediate problem, the usual method of air evacuation within a fighting zone is to send the commanding officer (flight surgeon) of one flight forward to the airfield from which patients are to be evacuated. There he coordinates with the ground medical installations to learn the number of patients requiring evacuation, maintaining at all times liaison with the flight operations officer of the airfield. In this way he is able to arrange for patients to arrive at the airfield at the time the evacuating plane is available for movement. It is highly desirable that the patients do not arrive at the airfield before the plane is ready to take on patients. The actual loading of casualties is accomplished by the air evacuation medical personnel in a matter of minutes. The same coordination is accomplished at the airbase in the rear areas, the ambulances being ready to move the patients to hospital immediately upon arrival of the plane.

Aboard these cargo or transport planes of the AAF, litter supports are available. Frequently they consist of metal racks, in which case, the C-47, for example, can carry eighteen patients. On other occasions, parachute webbing straps are used, in which event the same C-47 can carry 24 litter patients. Naturally, it is not desirable always to carry only litter cases; hence it is possible to mix litter and sitting or walking cases by using the "bucket seats" used by paratroops and other airborne troops on flights to the forward areas.

The evacuation team (one flight nurse and one staff sergeant) is aboard the plane flying supplies, materiel, equipment and personnel to the forward areas. They convert the ship to receive patients, and supervise their loading. When circumstances require it, they actually load the patients. The flight surgeon at the forward airbase keeps a complete record of all patients being evacuated, and the flight nurse aboard the plane makes a complete record for each patient, including the diagnosis, time in the air, altitude at which flown and the treatment required. Each evacuation team has available aboard the plane a "Chest, Airplane, Ambulance." This is a medical chest containing necessary equipment such as heating pads, bedpans, syringes, as well as the medicaments, blood plasma and food required enroute. In some cases the flight surgeon may accompany the flight, while in others the flight nurse may be alone on



Aboard a flying ambulance in the South Pacific, a flight surgeon and a flight nurse administer a blood transfusion to a wounded soldier being evacuated.

one plane and the staff sergeant alone on another. This occurs only when the number of patients to be evacuated necessitates the separation.

Personnel of the Medical Air Evacuation Transport Squadrons are carefully selected for their training in the AAF School of Air Evacuation at Bowman Field. It is truly a case of "many are called, but few are chosen." The applicant must pass the physical examination required of all flying personnel, and he must be recommended by the senior flight surgeon as being particularly adapted for air evacuation work. From this select group, an exceedingly small number enters the school every two months. Upon arrival at Bowman, they again are carefully examined by flight surgeons. The course of instruction for flight surgeons, flight nurses and staff sergeants is difficult and strenuous. It includes particular phases of aerial medicine, aeronautics, tropical medicine, intravenous therapy, field sanitation, field service, compass, map and aerial photography orientation, defense against air and gas attacks and many other military and medical subjects. Graduates are assigned either to a newly activated Air Evacuation Medical Transport Squadron or to an AAF hospital for duty while awaiting activation of a new unit or assignment as replacement for

personnel already serving overseas with air evacuation units.

In New Guinea, air evacuation began in August, 1942, and during the first 72 days of this service, more than 13,000 patients were flown across the Owen Stanley mountains. During last December alone, more than 7,000 patients were evacuated in New Guinea. A considerable number were flown to Australia. In the New Caledonia-Guadalcanal area, Army Air Forces, Navy and Marine Corps transport planes worked under a single command. Here evacuation of casualties began on September 3, 1942 and more than 17,000 patients have been flown out. In the North African Tunisian campaign which terminated May 23, 1943, the AAF evacuated more than 18,000 American, British, French and prisoners of war. During the Sicilian campaign, the Northwest African Air Forces (American and British) evacuated more than 14,000 patients by air. The 11th Air Force in the Alaskan area has evacuated over 1,000 patients by air this year. In the Libyan campaign, the 9th Air Force, supporting the British Eighth Army, evacuated by air more than 3,000 casualties during November and December of 1942. In the China-Burma-India theatre, our fighting forces are dependent upon air evacuation entirely. The transportation problem—



A battle casualty in New Guinea is placed aboard a plane which a few minutes before had unloaded equipment and supplies at a forward airbase.

the lack of roads and railroads—has made it inevitable that air evacuation play an important role in providing the high type of medical service that the American soldier deserves.

Yet, despite these accomplishments, early work in the field of air evacuation was not unopposed. Many staff studies, suggesting that air ambulances were impractical in war zones, pointed definitely to the medical dangers to be encountered in the transportation of patients by air.

Prior to 1940, in both American medical journals and those of foreign countries, many articles appeared concerning the types of patients that might be flown and the types that should not be flown under any circumstances. Experience has shown, however, that a detailed understanding of the physiology of flight and of aviation medicine as a whole is far more valuable than all the theoretical articles previously prepared. Medical personnel who have received adequate in-

struction in the care of patients while in flight have enabled the Army Air Forces to fly all types of patients without endangering their lives to the degree that travel by surface craft might have done.

The German Luftwaffe, in its "dress rehearsal" for World War II, held under the guise of aid to the Franco supporters in the Spanish civil war, evacuated casualties of the German Condor Legion by air over the Alps to German university and military hospitals. These flights of 1,500 miles were accomplished in ten to twelve hours, as compared to the many days required by boat. The patients were taken to altitudes ranging from 15,000 to 19,000 feet, thus making medical history in that for the first time records of actual transportation of battle casualties at such altitudes were available.

In September, 1939, the Luftwaffe, supporting the blitzkrieg as it rolled through Poland, evacuated approximately 2,500 patients from the Polish battlefields to the

hospitals of Germany. According to German press reports of August 9, 1941, some 280,000 casualties had been evacuated by air from the eastern front in the Balkans and Russia.

Few details are known as to the operation of air evacuation by our Russian allies. It is reasonable to assume, however, that they use air evacuation extensively, because of the vast distances involved in their battle lines. The British, Canadians, Australians, and French in most instances have used air evacuation facilities provided by the combined Allied Air Forces in the theatres of operations.

**D**URING the first World War, both the Allies and the Central Powers used combat planes to transport wounded personnel. At best, these were far from satisfactory since the patient was of necessity wedged into the narrow cockpit of the open planes. However, in France a young physician—a Dr. Chassning—who was likewise a great aviation enthusiast, invented what is thought to have been the first airplane ambulance. In 1917, Dr. Chassning, who represented the District of Puy-de-Dome in the French Chamber of Deputies, made his plea before that legislative body for an appropriation of funds to finance the development of his airplane ambulance. His plea was met with prompt and cruel criticism, one opponent demanding to know: "Are there not enough dead in France today without killing the wounded in airplanes?" But Dr. Chassning was persevering, and by the fall of 1917 he had secured the necessary funds and built his first military airplane ambulance. In the first flight at Villa Coublay in September, 1917, the doctor served as the first patient. His plane was used later on the Amiens front.

A few months later in the United States Maj. Wilson E. Driver, a reserve medical officer assigned to the Army Air Corps, enlisted the aid of Capt. William C. Ocker of the Air Corps, and they developed what is now recognized as the first American ambulance plane. It was plane No. 3131, placed in service at Gerstner Field, Lake Charles, La., in February, 1918. The rear cockpit of this plane—a converted (Continued on Page 53)

At an advanced base in North Africa, Medical Corps personnel prepare to remove wounded from an ambulance to a transport plane which will take them to well-equipped hospitals hundreds of miles from the battle front.

# PREPARE FOR



## TIMELY ADVICE FROM THE AIR INSPECTOR

*Matters presented here are informative only, and are not to be considered as directives.*

### TIPS FOR THE UNIT REPRESENTATIVE AT A PORT:

If you are ever assigned as a Port of Embarkation representative of an organization going overseas, the information below should be helpful to you. These tips were picked up by POM members of the San Francisco field office of The Air Inspector on a visit to a port:

Have several copies of shortage lists to avoid scurrying around for a typist to turn out additional ones.

Bring along a portable typewriter if possible.

Check with the various supply agencies at the port, even though the shortage lists are negative.

Be sure you understand everything in the movement order.

Don't forget to find out from your organization commander in what priority he desires to load his special and general purpose vehicles and organizational equipment, so that they will be in proper order for unloading at the debarkation point.

Keep in touch with your organization commander and inform him of any changes or deviations from planned procedure.

Don't forget to look at the port bulletin board for instructions, and check the message center frequently.

Keep informed on the status of your unit's property.

Be sure that when initial shortage lists are submitted, an entry is made thereon which will clearly cancel any previous requisitions.

Remember that the following medical supplies are automatic issue: sulfa drugs, foot powder, adhesive tape and first aid kits.

Remember, too, that cleaning and preserving materials for individual weapons during the voyage are a matter of issue by the ordnance supply agency at the port.

**FAREWELL TO ARMS — UNNECESSARILY SORE:** Unnecessary "repeat performances" of immunizations should become a thing

of the past through careful adherence to the provisions of AAF Memo. 35-2.

This memorandum directs that an original and duplicate copy of the Immunization Register will be made in all cases. Whenever an immunization roster is furnished by a station hospital to an organization, original copies of Form 81 for individuals immunized will be attached. Immunization data will be recorded immediately in the Service Record upon receipt of the original copies of Form 81, and these copies will then be attached to the Forms 28 (Individual Pay Records) of the enlisted men.

If the original copy of the Form 81 is lost, a true copy, signed by a commissioned officer, will be furnished the enlisted man. Information will be obtained from the Service Record or from the copy retained by the station hospital.

In case a soldier becomes separated from his Service Record, his organization commander will accept the evidence of the original immunization register in the possession of the man, pending the receipt of his Service Record.

**TELL THEM MEN ARE COMING:** Unexpected guests can be just as disturbing in the Army as in civilian life. It is not intended that enlisted men should arrive at a station with no provision made for food and quarters. Commanding officers and transportation officers are reminded of the provisions of WD Cir. 102, 1943, Par. 3b (1):

"The station commander (transportation officer) at the point of origin of each movement will inform the station commander (transportation officer) at destination by telephone or telegraph (not radio) of the unit designation, strength, date of departure, and expected date and hour of arrival of each element. This

notification will be given for all movements of units and detachments and will be made in sufficient time to permit proper arrangements to be made at new station for the reception of the troops."

**REALISM IN FIRST AID TRAINING:** Making first aid training as realistic as possible is a problem for instructors in this country. It is no problem overseas, as the men's interest increases in proportion to their nearness to combat.

When a gunner is taken from a bomber with a bullet in his arm, and the medical officer says his life was probably saved because a crew member applied a simple tourniquet promptly, every man on the station is convinced of the value of first aid training.

You can't shoot a man in the training phases to demonstrate the practicability of first aid, but

you can produce some "reasonable fac-similes" of the real thing. Some bases have staged sham battles as part of the first aid classes, and the realism obtained in caring for the "wounded" was most effective.

**RATIONS ON TROOP TRAINS:** Base administrative inspectors can be of real service to officers appointed as train commanders, quartermasters or mess officers in the movement of troops by rail. Inspectors should contact the train officers, especially if they are inexperienced junior officers, and go over WD Cir. 100, 1943, with them. No officer should be in charge of troops on a train unless he thoroughly understands the use of rations and ration funds. (AAF Memo. 67-17)

**FROM THE MEN WHO KNOW:** Draw up a chair, crew members, for those "bull sessions" with colleagues returned from overseas. Tactical inspectors are urging



trainees to listen carefully when combat veterans start relating their experiences. Reports from overseas reveal that many bombers have shaken off all the flak the enemy could turn loose because of pointers the crew members picked up by listening to men who had been in action before them.

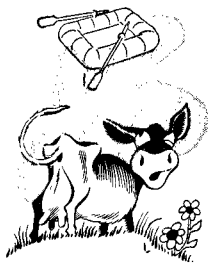
#### LIFE RAFT HAZARDS:

"There's a life raft out in my north pasture. It came floating down from the sky and darn near scared my cows to death."

The South Dakota farmer telephoning this information to an airbase was reporting something which you technical inspectors in the field should strive to prevent by spot-checking bomber life raft compartments.

Packing too much equipment in the compartments or placing wrong size rafts in them may cause the spring locks to give way from strain. The resultant damage may be much more serious than a few frightened cows. The dropping of the rafts into the air stream is liable to cause a smashed tail surface and a fatal crash.

**'BURY' YOUR HELMET LINER:** Just imagine, soldier, that your helmet liner is the last one you will get for the duration and take care of it accordingly. As a



matter of fact, you may find yourself in a spot overseas where it is impossible to get another liner, and uneasy will lie the head that wears a cracked one.

Particular care should be taken in stowing the liner in your barracks bag. Ordinarily, in troop movements the liner is worn, but if it isn't, be sure to surround it with clothing. (WD AGO Memo. W600-71-43)

#### CHECK SPARE PART SPECIFICATION:

Crew chiefs, carefully compare the specification number of a new part with the number of the part it is to replace in a plane. There may be trouble in the sky if you don't.

The fuel line is an example of the many items the specification numbers of which should be checked. The wrong line may not be strong enough to withstand a strain of high altitude and may collapse, causing fuel stoppage.

#### CRACKS IN TURRET DOMES:

Reports from combat theatres indicate that under the rigors of extreme heat turret domes of plastic construction may develop cracks. These cracks, due to expansion and contraction, usually are first noticeable around the base of the dome. Frequent inspections should be made to discover these cracks and renew the dome before the cracks become large. If cracks are neglected, buffeting of the wind will finally cause a complete dome failure, and, when the dome rips off the turret, severe injury may be caused to the turret gunner.

## ★ INSPECTING THE INSPECTOR

Are you delaying thorough inspections of organizations until they are alerted? They need this help on details throughout their entire training period.

★ ★ ★

Are you checking to see that additional items are entered on Form 20 (Soldier's Qualification Card) as prescribed in Par. 3, AAF Reg. 15-126, 2 August 1943?

★ ★ ★

Are you following through on inspections of organization sets of regulations and directives to be sure that requisitions are submitted for needed publications?

★ ★ ★

Are you checking to see if the "Spartan simplicity" policy is being followed in post construction? Only the most urgently needed painting and repainting will be permitted. (WD AGO Memo. W345-23-43, 24 August 1943)

★ ★ ★

Have you inspected bulletin boards recently to be sure they are not cluttered up with obsolete matter?

**LIGHTS OUT:** Burning midnight oil is all right at midnight, if necessary, but it is certainly not necessary at high noon. Administrative inspectors should make frequent checks to see that lights are not left burning needlessly during the day. Doorway lights of barracks and other buildings especially should be checked. ★

## ★ HERE ARE THE ANSWERS

**Q. Where do you obtain Standard Form 1055, used in claiming arrears of pay for deceased personnel?**

**A.** This form will be furnished the proper claimants by the Finance Officer, U. S. Army, Washington 25, D. C. (Ch. 1, AR 600-550)



**Q. May liaison pilots fly planes of more than 180 horsepower?**

**A.** Yes. Liaison pilots are now restricted to liaison type aircraft of 190 horsepower, instead of 180. (AAF Reg. 35-27, 17 August 1943)

★ ★ ★

**Q. Is information as to name and address of emergency addressee still required on identification tags?**

**A.** No. (Ch. 25, AR 600-35) No ef-

fort should be made, however, to revise identification tags now in the hands of individuals.

★ ★ ★

**Q. How often must military personnel be revaccinated for typhoid fever and paratyphoid fevers?**

**A.** Annually. (Ch. 6, AR 40-210)

★ ★ ★

**Q. If movement orders for overseas specify yellow fever vaccination, should the vaccination be delayed until arrival of individuals at the staging area or port of embarkation?**

**A.** No. Such vaccination will be accomplished at the station of final phase training immediately upon receipt of movement orders. (Letter, Hdqts. AAF, 10 September 1943, AAF 062.2)

★ ★ ★

**Q. If trunk lockers are not available for officers going overseas, may box lockers be requisitioned as substitutes?**

**A.** Yes. (WD Cir. 196, 1943)

★ ★ ★

**Q. If a disbursing officer fails to take advantage of discounts for the payment of bills within a certain time, must he justify his failure?**

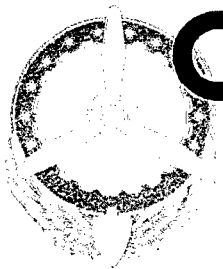
**A.** No. He will take advantage of all discount features, if possible, but there is no obligation upon him to justify failure

or to obtain waivers for failure to take advantage of discounts in those cases where payment is made after the expiration of the discount period. (Ch. 1, AR 35-6200)



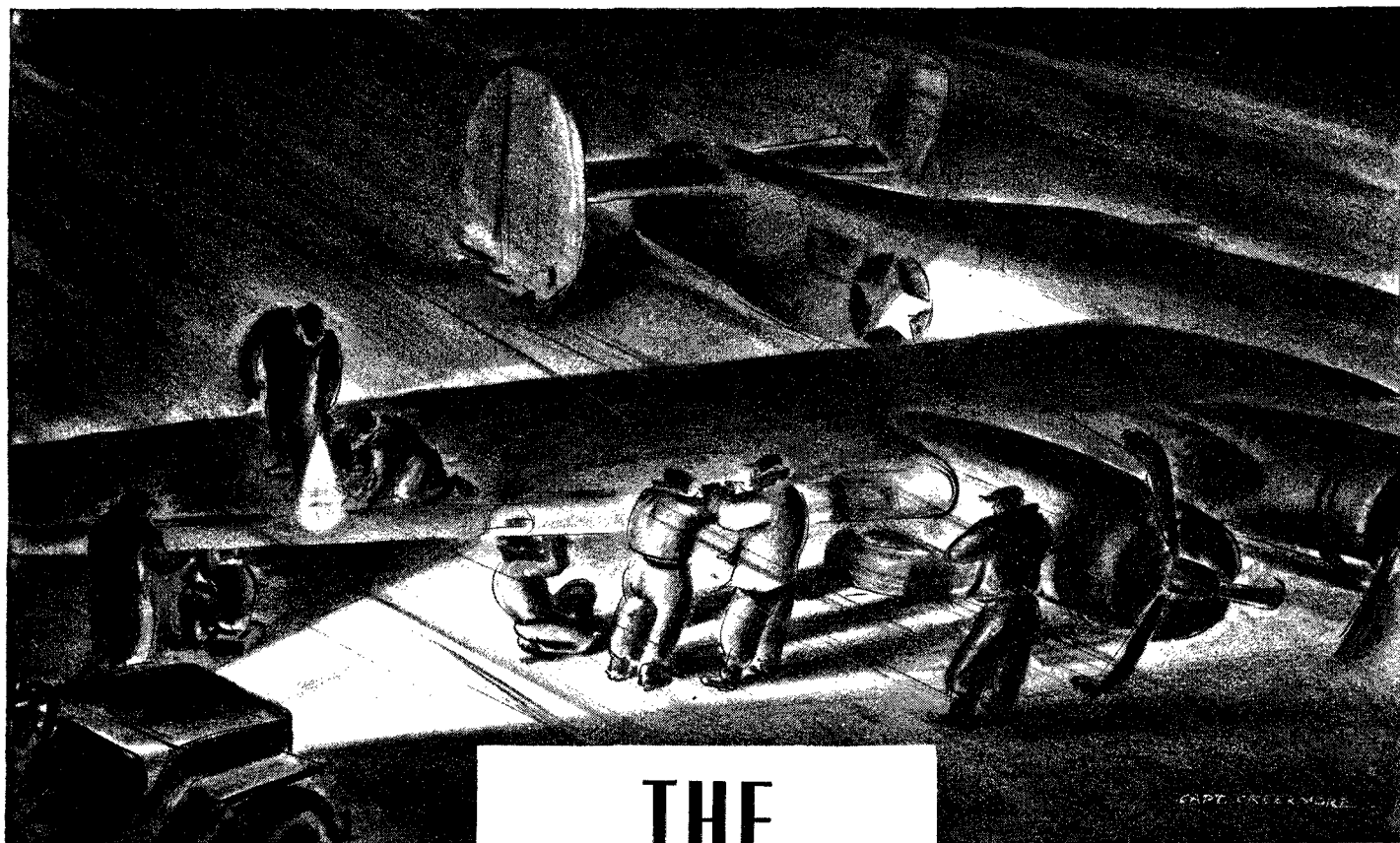
**Q. When is a per diem allowance authorized instead of a mileage allowance for travel?**

**A.** Per diem is authorized in connection with travel only when it is considered that the length of temporary duty may result in expenses that will exceed the reimbursement on a mileage basis and thus cause the traveler to suffer a loss. In all other cases payment of a mileage allowance is the normal form of reimbursement for ordinary travel in a mileage status. (Ch. 1, AR 35-4820)



# ON THE COMBAT LINE

AIR SERVICE COMMAND REPORTS FROM THEATRES OF OPERATIONS



## THE RAMBLING WRECK

Illustrated by CAPT. RAYMOND CREEKMORE

THEY thought "Jap Picnic" was through with flying that afternoon in September, 1942, when she was reduced to a mass of tangled wreckage in a taxiing collision on bleak Aggatu Island in the Aleutians. But with that wreck began the most interesting chapter in the career of the battle-scarred B-24.

An engineering officer, Capt. Doug Symington, put Jap Picnic back in the air, piece by piece. Here's how it was done:

Two months after the field collision, a bomber limped into Aggatu from a mission over Kiska with the leading edge of a main wing spar shot up and a de-icer boot badly damaged. There were no parts in stock so Master Sgt. R. M. Brosius, line chief, put his men to work on the carcass of Jap Picnic. With eight men, including Gilbert Hansen, civilian representative of Consolidated Aircraft, they braved a 35-knot gale through an entire night removing hundreds of little screws to dismantle the damaged spar, boot and de-icer from the damaged plane and from the "wreck." They then fitted the specialized bones of old Jap Picnic into the

wounded bomber. They worked by the uncertain rays of flash lights and jeep headlights without any shelter from the storm.

Only two fragile 3/16th drills were between the crew and failure and one of them shattered as the second hole was drilled. The remaining drill had to last and did. After each drilling it was re-sharpened on a hand grinder clamped to the fender of a jeep. The tedious job required ten hours and at 0500 she was ready to fly a combat mission.

Two weeks later another B-24 returned from a Kiska mission with one prop feathered and an engine frozen stiff. Re-

placements were not in stock. The ground crew pounced on the remains of old Jap Picnic, wrestled an engine from its nacelle and substituted it in the crippled plane. This job was done in less than 19 hours through a 45-knot gale that whipped sleet and snow about in below-freezing temperature. Tarpaulins partially protected the men from the sleet that bit like steel. Crew chief stands and workmen were hurled to the ground by the frigid blasts; the plane was lashed to a tractor and a jeep to hold it on the ground. With tools meant for second echelon maintenance, the crew completed the job in time for ship No. 1816 to fly a combat mission the next afternoon. Another hunk of Jap Picnic was in the air again.

Ship No. 1091 came in with all the wires from the bombardier's compartment to the bomb rack burned out—more than 100 wires servicing 20 stations. The ground crew snipped the wires from Jap Picnic's insides and spliced them end to end in the nerveless ship. There were 150 wires and each had two



joints to be soldered, taped and shel-lacked. Only one man at a time could carry on the job because of the shortage of tools and the cramped quarters. Lying on his back, he would work with his arms outstretched until his muscles became cramped. Then another man would take his place.

It took fifteen hours of this exhausting work before 1091 was back in service, but she passed inspection for third echelon maintenance.

Old Jap Picnic someday will be bombing Tokyo. She can't miss for she has turrets, a nose section, her rudder, a wing tip, flaps, radio, ignition parts, a prop governor, trim tabs and other odds and ends in almost every heavy bomber flying for the 11th Air Force. And, to make sure that none of her parts are wasted, Maj. Robert Orth acquired her cockpit carpet for his quarters. Despite her loyal military service, she also had to serve as a privy for a time. A seat was wrenched out of her to make an open air toilet.

## INVENTORS IN NORTH AFRICA

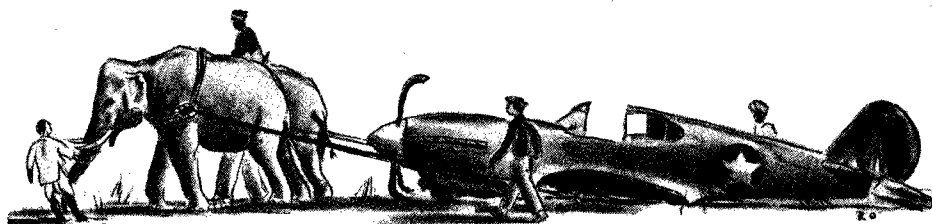
AMERICAN boys who made their jalopies run with bent nails and bailing wire have taken their resourcefulness with them to North Africa. A staff sergeant with the 12th Air Force has used salvaged parts to devise a testing board for almost every instrument on the B-17 control panel and has made a generator testing device from a gun turret mechanism. With odds and ends, he has built an inter-communication system for his camp in Africa. For the medics on the base, the mechs have made a sterilizer. As in most GI inventions, the basic parts came from that highly adaptable item — the 55-gallon drum.

## A MAINTENANCE TIME-SAVER

STAFF SGT. ROBERT HAMMEL gets restless when he sees work being performed tediously by hand. A mechanic at an advanced depot of the 8th Air Force Service Command, he concluded that a lot of man hours were being wasted in polishing the booster coil points of a bomber engine. By fashioning a three-piece tool and fitting it to a drill press with an electric motor hook-up, he developed a first-class polisher that saves one hour and twenty minutes on each set of points.

## THE MEN BEHIND THE GUNNERS

At another 8th Air Force Service Command air depot, Staff Sgt. Russell Schlick helped the gunners in his outfit knock down an extra Jerry or two by developing an adjustable sight for long-range shooting. His invention, an adjustable ring and post sight for certain guns, now enables gunners to adjust their sights for almost any target distance within the effective range of their guns.



# RECLAIMING A WRECKED P-40 FROM THE BURMA JUNGLE

A FEW days after Christmas in 1942, Lieut. Allen Whittington, engineering officer, received word that a P-40 had crashed on a river island 100 miles from his base in the Assam-Burma combat area. His job was to take his salvage crew to the jungle island, reclaim the plane, return it without further damage and rebuild it in a minimum of time.

Lieutenant Whittington chose as his salvage crew Tech. Sgt. Herbert Kraling, Staff Sgt. Ronald McDonnell, Cpl. Hucle Truly, Cpl. Lewis Beezely, Cpl. Leo Park and Pvt. Thomas Cobb.

With ten-day rations and tools and equipment for dismantling the plane, the salvage crew piled into a DC-3 in the afternoon. The wreck was spotted from the air about fifty yards from the river bank. The pilot set the transport down in a nearby grass field and the salvage crew unloaded and prepared for action.

The P-40 pilot had escaped unhurt and had obtained two elephants to tug the wreck through the jungle to the river bank where it could be loaded on a barge. The day after reaching the island, Lieut. Alfred Wipf, fighter squadron engineering officer, Lieutenant Whittington and Sergeant Kraling negotiated a trail to the river's edge about thirty miles upstream. Without great difficulty, they were able to rent a rice barge from a native Indian for 300 rupees (about \$100) with a bonus if he would hurry. The barge was nine feet wide and sixty feet long.

The native agreed to take his barge down-river to the spot near the wrecked plane, so Lieutenant Whittington returned to the camp of his salvage crew where plans were made for disassembling

and transporting the P-40 to the barge on the river bank.

On the fifth day the salvage crew succeeded in getting all equipment to the plane where a tent was set up for quarters. Tail sections and engine were removed, and the engine was put on a shipping stand that had been brought along. A contract with the village chief produced a bamboo ramp from shore to boat.

Two days later, after all plane parts and salvage equipment had been loaded, the crew broke camp and began poling the boat down the river.

On the tenth day the salvage party reached a point on the river where Lieutenant Whittington, who had returned to base to make further arrangements, was to meet them with trucks.

Lieutenant Whittington, meanwhile, had mapped a road from the base to the barge landing spot. This job required more than 200 miles of driving over jungle paths and wagon trails in a jeep to find a passable truck route. A trailer then was built from a truck chassis by Tech. Sgt. James Quinn, Staff Sgt. Theodore Dorn and Cpl. Harold Busch.

At 0100 the following day, the truck detail reached the barge detail. Dense fog hindered the loading but the job was accomplished. The P-40 arrived at the base on January 9, fourteen days after the plane had crashed and twelve days after orders had been received to reclaim it.

The salvage detail of the service squadron had travelled 100 miles by air, 150 by boat and more than 150 by truck. Rebuilding the plane for combat service came easy. ☆

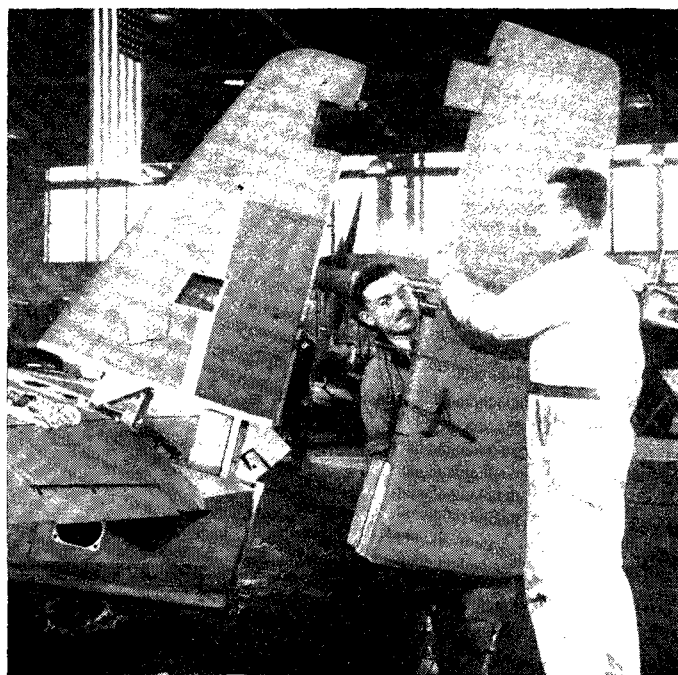
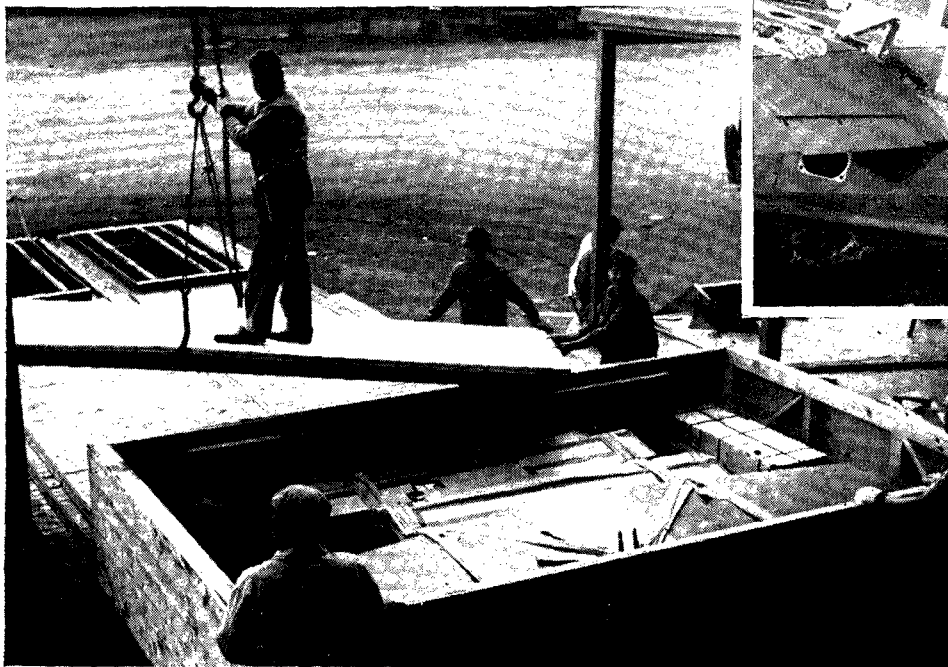


# PRELUDE



Like the shadow and shape of flights to come, these planes await against the clouds for shipment overseas. They have just arrived by "flyaway delivery" from plants all over the nation. In these shakedown flights they have revealed any faults for correction before they fly against the enemy.

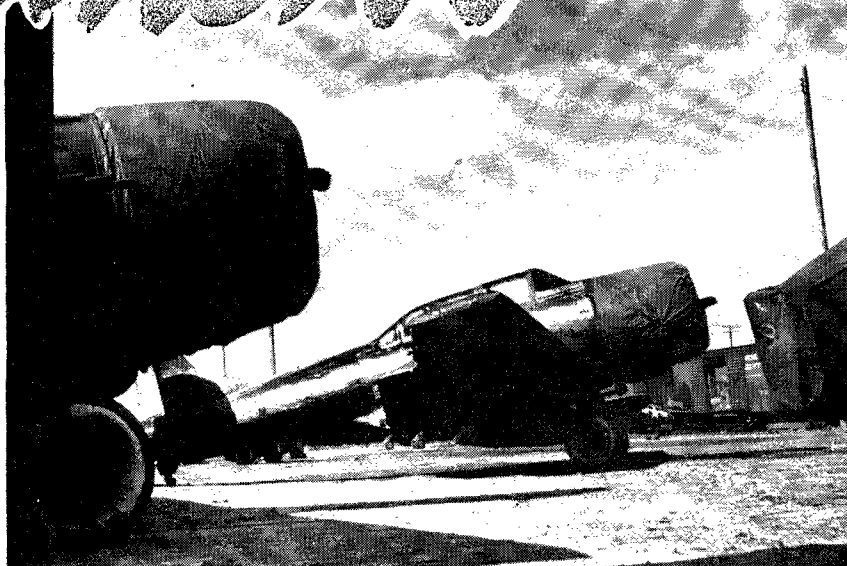
Accompanying each plane on the ocean crossing is its individual packing case carrying the propeller, wing tips and other parts which may be reassembled overseas to place the plane in readiness for combat.



From the "staging area" the planes are towed into hangars where dozens of workmen swarm over them to remove the propellers, tail assembly and wing tips. Each seam is taped water tight. They tape every outlet and vent, install dehydrator plugs, drain the oil and hood the engine with heavy tarpaulin. Every conceivable thing is done to protect the plane from damage on its ocean voyage on the deck of a ship.

# TO COMBAT

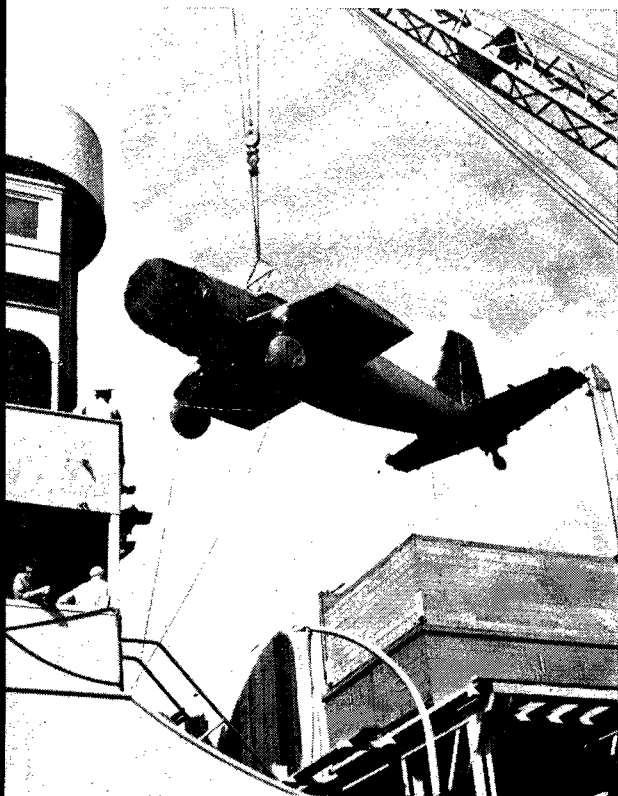
**T**HE Atlantic Overseas Air Service Command has a goal of empty warehouses. Warplanes by the thousands are flown into the command area at Newark and prepared for delivery to our fighters overseas. Any disruption in this gigantic torrent of war materiel can cause the warehouses to bulge. It is the job of thousands of officers, enlisted men and civilian workers to expedite the flow of AAF and air lend-lease materiel through Atlantic and Gulf Coast ports to overseas theatres of operations. There is little glamour in crates and boxes, but they go to the men who win the medals. AOASC workers, one officer explained, are the embodiment of people who stand in reflected glory. "Our morale rides like a kite on the tail of a fighter plane," he said. ☆



Waiting like trussed birds, these planes are ready to be loaded on the decks of oil tankers, merchant vessels or warships. Almost everything that floats is used to carry a complement of fighter planes across the seas. The aircraft above are now completely taped and sprayed with an oil coating to protect them from salt water and spray.

Close-ordered as infantrymen, these P-47s stand on the deck of a small aircraft carrier to be taken to a theatre of operations. The Atlantic Overseas Air Service Command, the AAF's greatest shipping outlet, is keeping the warehouses empty.

The ocean voyage begins when the great hydraulic cranes lift the planes from the dockside and swing them to the deck of a ship. Each plane has its individual packing case carrying the disassembled parts.



**AIR FORCE, December, 1943**



# PREPARE FOR DITCHING

*The following summary of ditching procedures was prepared by the Office of Flying Safety in cooperation with Bombardment Department, AAF School of Applied Tactics. —THE EDITOR.*

**T**HE pilot and crew of a B-17 returning from a raid on Wilhelmshaven early last spring ditched their ship in the face of almost incredible odds.

The bomber dropped out of a formation over the English Channel shortly after leaving the continent. Two of its engines were shot out and a third was operating improperly. A pack of Focke-Wulfs pounced on the crippled plane for a kill, and as the pilot reported later:

"The situation looked completely hopeless."

With one good engine, the pilot managed to keep up an evasive action while his crew played a stream of lead into the attackers. The ship's tail, now almost chewed in two by enemy fire, started blazing. The right waist gunner succeeded in smothering the fire, only to have another crop up in No. 2 engine. The co-pilot managed to extinguish this one.

Between 7,000 and 8,000 feet, the pilot decided that ditching was inevitable, so he immediately issued the preparatory order.

All but two of the enemy fighters had been left behind. The Fortress was out of ammunition, except for the top turret guns. Realizing this, the remaining attackers came in deliberately for the kill. Crew members were now at their ditching posts in the radio compartment, so the co-pilot took over the top turret and waited patiently for the enemy fighters to close in. When the nose of the lead FW came into his sights, the co-pilot pressed the trigger and caught the enemy cold at 125 yards. The last attacker was dispatched by another B-17 which by then had come to the rescue.

The pilot made a perfect landing with only one engine.

The plane remained afloat for three minutes.

Less than thirty hours later, members of the crew were rescued from the rubber dinghies.

The pilot who was responsible for this outstanding example of ditching had stressed the necessity for correct rescue procedure and regular dinghy drills.

**L**ANDING a big bomber in the ocean and transferring its crew into a rubber dinghy about the size of a mattress is not an attractive sport.

It's a complicated and dangerous job which taxes the skill and resourcefulness



This illustration for a poster prepared by the Office of Flying Safety shows crew members abandoning their B-17 after a successful emergency landing at sea. The pilot is escaping through the left side window; the co-pilot, already out, is working back to the wing and his place in the right dinghy; the ball turret gunner, astride the fuselage, and the bombardier, just visible in the hatch, are the last to leave the radio compartment; the tail gunner is seated in the left dinghy holding a ration pack; the navigator is boarding the same raft while the radio operator holds the dinghy line; the left waist gunner is carrying a thermos jug across the wing; the flight engineer is sliding onto the right wing, and the right waist gunner is holding the right dinghy in place.

of each member of the crew, and which, if not successfully executed, may shorten the life expectancy of the bomber's personnel.

The chances of survival when forced down at sea are in direct ratio to the interest shown by the crew in "dry run" ditching drill.

The need for a correct guide to such drill became evident to the British shortly after the RAF began its attacks on the European continent. It was obvious that every effort must be made to save valuable crews forced down in the Channel and North Sea. Studies of various forced water landings were made, and from these certain procedures were established and advocated.

The arrival of America's 8th Air Force necessitated an even more concentrated program of education along this line, plus the installation of an air-sea rescue unit. The Office of Flying Safety, Winston-

Salem, N. C., was requested to study the problem and prepare a series of five posters outlining methods of ditching the B-17, B-24, B-25, B-26 and A-20.

This agency, after exhaustive studies, has completed five graphic posters suggesting the procedure for an ocean landing.

The welfare of the crew after the landing also has been taken into consideration in an emergency booklet soon to be out which carries a section dealing with ocean survival. This booklet tells the crew what to do after the landing has been successfully executed and the plane abandoned.

To gain a thorough understanding of ditching, the subject should be approached in three phases: preparation, actual ditching and subsequent survival.

The age old axiom, "an ounce of prevention is worth a pound of cure," has been cuffed about considerably but it provides an excellent golden rule

## Your chances of surviving an emergency landing at sea are enhanced by constant drill in proper procedure.

to be followed by every bomber crew.

Preparation for ditching should start before the plane leaves the ground.

Drill comes first and foremost in preparation and is the direct responsibility of the pilot. It should include the practice of each crew member's duties after the order "prepare for ditching" is given until the rescue plane or ship arrives.

When each man knows his duty well enough to perform it mechanically, and if need be in a darkened ship, his education can be considered at least partially complete.

The wise pilot will also see that inspection of all equipment before long overwater missions is a *must*. This calls for a thorough check of each piece of emergency equipment, not only to see that it is in the plane but to determine whether it functions properly. This check includes the CO2 cartridges on life vests and rafts. Ration kits without food or water are good for little other than bailing, so a check to see that water containers are filled and food is in good condition might stave off hunger and thirst if a forced landing occurs.

Signaling equipment is the one link raft occupants have with civilization. Thus the importance of workable accessories such as an emergency radio, Very pistols, sea

marker and signaling mirrors is obvious.

A jammed hatch can become very annoying when water is up to one's neck and escape is essential to continued breathing. By testing escape hatches before take-off, crew personnel may avoid any such embarrassments.

It's too late to check these items after the ditching order has been given.

Contrary to popular belief, the camel is not alone in his ability to store water. Recent life raft tests conducted in the Gulf of Mexico proved that the human body also can store water.

Thus it is important that each member of the crew drink as much as he comfortably can hold before departing on an overwater trip. If a forced landing at sea appears imminent while in flight, it's a good idea for the crew to fill up from water stores which cannot be taken aboard the raft. This applies to food also.

The Mae West of stage and screen may be a glamorous gal but the life vest of the same name is a more practical companion for a man if his plane has let him down. In fact it is the most important piece of ocean survival equipment he possesses and should be treated as such. To get best results, the wearer should don it upon receipt, inflate both sides and adjust leg and waist straps. Otherwise he

may find himself tied in a knot the first time it is inflated, and the wing of a sinking plane offers few advantages of a dressing room.

The pilot's popularity with his crew may have suffered slightly during the weary hours of drill, but it will bounce back to a new high when the ditching actually occurs.

Assuming that he is the pilot of a B-17 which is being forced down over water, a glimpse of the inside of the Fortress during preparation, actual ditching and escape should show the procedure outlined in the posters prepared by the Office of Flying Safety.

It is evident that his plane will have difficulty in reaching shore so the pilot notifies the radio operator to transmit a distress call, giving position, course and speed of the plane. Correct drill has taught him that it's always safe to be prepared in advance. If ditching seems unnecessary later, the call may be quickly cancelled.

If fuel is low—say only five minutes' supply remains—the pilot immediately issues the order to "prepare for ditching." A power landing is important.

Drill has been worked out on the ground, so each member of the crew responds in the order practiced—"co-pilot ditching," "navigator ditching," and so on, until each man has acknowledged the order.

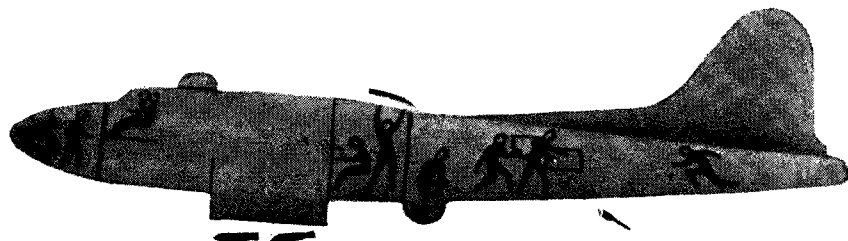
Crew members now loosen shirt collars and remove ties, lest they serve as a noose to strangle the luckless crewman. Unless the plane is at an altitude of over 12,000 feet, oxygen masks are removed. If over 12,000 feet, the main oxygen supply or emergency oxygen bottle is used until the pilot advises otherwise. Heavy flying boots are slipped off but clothing for the cold nights on the raft is worn.

The inside of the big bomber is a busy place now. Crew members are heaving out all loose equipment—guns, ammunition and anything that might serve as a lethal battering ram upon impact. Bombs and depth charges—if any—are jettisoned. If the plane is too low to permit this, they are placed on "safe." A rack full of live bombs is about as fragile as a sack of eggs but the effect upon impact is slightly more noticeable.

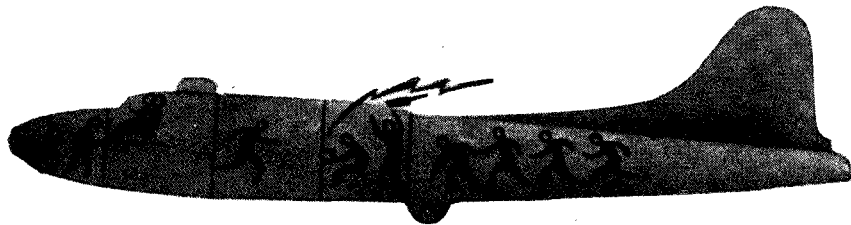
If the bombs have been successfully dumped, the bomb bay doors are closed to prevent an inrush of water upon landing. Landing gear is also up and all lower hatches are securely fastened after equipment has been jettisoned. Upper escape hatches on the other hand are jettisoned to facilitate a quick exit upon landing.

The navigator has found enough to keep him busy, since it's his duty to calculate position, speed and course.

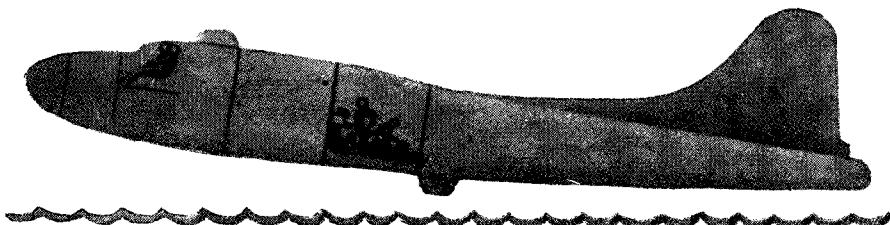
Rescue units find it helpful to know the position of a plane forced down at sea, so the navigator passes this informa-



Jettisoning bombs and all loose equipment to be ready for ditching.



Radio operator sending SOS, position and call sign continuously.



Plane, tail well down, preparing to make the emergency landing.



tion on to the radio operator. The radio operator is plugging away at his set now, relaying all data handed him by the navigator and repeating it along with SOS calls.

The pilot has opened the window at his side and the co-pilot has helped fasten his shoulder harness as a guarantee that his face won't become part of the instrument panel upon impact with the water. The co-pilot has also opened the side window through which he is to escape and has pulled his seat well back, adjusting his own shoulder harness.

The pilot meantime has given the crew a running account of what's going on with repeated observations on the ship's altitude. Orders are not necessary because each man knows his job.

Members of the crew, having jettisoned equipment and closed hatches, are now proceeding to the radio compartment in much the same orderly manner that school children conduct a fire drill.

The navigator picks up maps and celestial equipment to carry into the life raft, and locates the emergency radio and signal set for later use.

The bombardier, after destroying the bombsight, goes to his position in the radio compartment, closing the forward door after him.

The flight engineer upon arrival jettisons the radio hatch or lowers the radio window and secures the emergency ration pack to his arm with an attached rope.

The ball turret gunner enters next, followed by the right waist gunner and left waist gunner, each carrying equipment for dinghy use which they have picked up aft in the fuselage.

The tail gunner follows with an emergency ration pack.

The radio operator remains at his post transmitting distress signals until the pilot orders him to take his ditching post.

All members of the crew are now in crash position in the radio compartment. Loose equipment has been jettisoned or thrown into the bomb bay. Both doors to the compartment are closed and equipment for use in the dinghies is firmly held.

Parachute pads, seat cushions and other padding are being used by crew members to take up the shock of impact, protecting their faces, heads and backs.

Five seconds before the impact, the pilot orders "brace for ditching" over the interphone or by pre-arranged signal. The radio operator, now in position, relays the order to other personnel in the compartment, having heard it over the interphone he is still wearing. The emergency radio key is clamped down so that signals are transmitted continuously until after the plane lands.

The crew now braces for the two impacts they have been taught to expect—the first a mild jolt when the tail strikes, the second a severe shock when the nose

of the bomber ploughs into the waves.

All possible preparations have been completed and it's now up to the pilot to ditch the Fortress.

The crew may be thinking about the girl back home at this point, but the pilot is busier than a bootlegger at a traveling salesman's convention. The sea below him is a tricky landing strip and he's probably trying to recall a few tips he learned during the ground drill.

Old sailors are familiar with the term "seaman's eye," which literally is the art of interpreting the sea. The pilot may not have developed "seaman's eye" but he recalls a few things that may help him set his lumbering bomber down.

Waves, for instance, move downwind in open sea and the spray from them tell him which way the wind is blowing, a much more reliable method than wetting a finger and holding it up. If there are no waves, he notes the wind lanes—nothing more or less than a series of lines or lanes of alternate strips of light and shade on the water. These also indicate wind direction.

To determine wind speed, he remembers a little table he studied:

A few white crests indicate 10 to 20 mph wind; many white crests 20 to 30 mph; foam streaks 30 to 40 wind velocity, and spray from crests indicates a wind speed of 40 to 50 mph.

If the sea is glassy—and it's most difficult to determine altitude under such conditions—the pilot may allow the trailing antenna to judge for him. When this antenna strikes the water, the radio operator will get the signal and pass it to the pilot.

Under this condition, the pilot approaches the sea with power on, flaps down, tail well down. If waves exist, he approaches into the wind at right angles to them. In case of swells, he knows that the plane should be landed along the top and parallel to the swell, provided the wind does not exceed ten miles per hour.

If the ditching takes place at night, landing lights may be turned on, provided the reflection does not confuse the pilot's vision. Bright lamps within the plane are turned off, but may be snapped on after landing to illuminate the scene and guide possible rescue parties which might be nearby.

Life jackets have been worn throughout the ditching. They should not be inflated until exit has been made. Otherwise they may be punctured or may prevent passage through the hatch.

Each man holds his position until the plane has come to rest. Now the ball turret gunner pulls both dinghy releases. This automatically inflates the stored life rafts, which pop out onto the wing. Personnel exit in the orderly manner practiced, each carrying a designated piece of equipment.

The order in which they exit and go to dinghies follows this pattern:

Pilot through side window to left dinghy, co-pilot through right window to right dinghy, tail gunner first from radio hatch to left dinghy, navigator next to left dinghy, then the right waist gunner to right dinghy, flight engineer to right dinghy, radio operator and left waist gunner to left dinghy and ball turret gunner and bombardier to right dinghy.

Another OFS poster illustration shows a B-25 forced down on a choppy sea. Two members of the crew launch a dinghy while the others see that emergency equipment is carried from the plane.



The rafts are attached to the plane by a line but members of the crew take precautions now to prevent launching the raft where it may be punctured by any jagged plane edges. Care is also taken that it is launched and inflated right side up.

It may be quite proper to jump into a fireman's net from a burning building but it is extremely hazardous to jump into a rubber life raft.

Some of the equipment needed will already be stored in the raft; the remainder which has been brought from the plane must be hauled aboard and securely fastened. A quick check is made immediately to insure the presence of all necessary items—ration kits, emergency radio and signaling equipment. Parachutes will be carried along by wise personnel since they can be used for sails, cover and protection against the sun.

Both rafts have cast off from the plane and are tied together. If the plane is still afloat, the crew knows it's a good idea to stick around. A raft is hard to spot on the ocean, but the plane's outline can be readily seen from the air.

The plane has been successfully ditched, personnel are in the dinghies and in all probability the nearest land is several miles down. Where to? is the next logical question.

There are no handy road signs—that's a cinch—and waves have a monotonous uniformity which doesn't identify one's whereabouts. Therefore, it's up to the navigator to furnish an estimated position either from calculations made aboard the ship or if at night by celestial navigation.

When all this has been decided, it's wise to lay out a course to some definite objective and then try to stick to it. There are three important aids to survival which won't be found in the emergency kits—determination to get ashore, calmness and common sense. Raft occupants should keep their shirts on—figuratively and literally.

Clothing not only protects the wearer from cold at night but staves off serious sunburn caused by direct and reflected rays of the sun. Protection from the sun is particularly important in the tropics. The tropical sun not only results in severe sunburn for the unprotected but increases thirst. The tarpaulin in which rations were wrapped or a sail may be rigged, yellow side up, as a canopy or sun shade. The yellow side is spotted more readily from a plane.

Having no knowledge of when land will be reached or a rescue effected, the pilot takes stock of food and water and plans a course of rationing to cover as much time as possible. Neither food nor water is allowed for the first 24 hours.

A man in good physical condition can live for twenty or thirty days without food. Without water, he can survive only about a week and a half at the most.

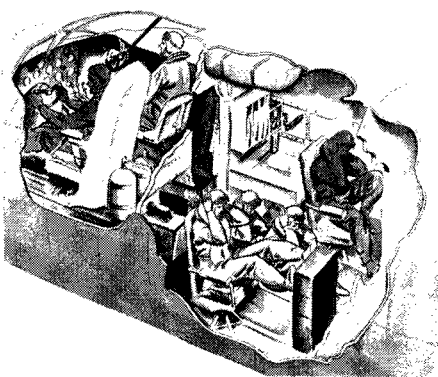
With little water on hand, food should be eaten sparingly since it increases thirst. Water best serves as a thirst quencher when held in the mouth, swished about the tongue and gargled. Salt water as a beverage is taboo but as a cooling bath it may have possibilities, provided the hygienic raftsman keeps the water out of his mouth.

Gum-chewing relieves mouth dryness; smoking causes it.

In the event of rain, the tarpaulin or sail can serve as a rain catcher after the salt crust has been washed away. As much water as possible should be drunk. The rest stored in containers.

With sufficient water, food now poses a problem. The fishing kit provided in all rafts may not be Isaak Walton's idea of a complete set, but has proven that it will catch fish.

It is necessary to eat the fish raw but, strangely enough, raw fish is neither salty nor unpleasant to the taste if cleaned upon catching and washed free of blood.



B-17 crew members are shown in crash positions they take just before the plane strikes the water. These positions, maintained until the plane comes to rest, reduce the possibility of injury.

The liver and entrails may be used for bait.

Shark should be eaten only when water supply is adequate. This applies also to skates, rays, seaweed and crabs. Jellyfish, sea snakes, parrot fish and puffer fish are poisonous to humans. However, most fish found in mid-ocean are safe to eat.

Raft health has nothing to do with the condition of the rubber dinghy, although frequent checks of the craft are advisable. Raft health has to do with the physical condition of its occupants, which may fall below the Army doctors' standards if they've been in the raft for many days.

A raft ailment that can become serious unless proper precautions are taken is a condition known as "immersion foot." The extremity referred to becomes swollen and numb, and breaks out in sores if continually exposed to cold sea water in the necessarily cramped confines of the raft. If allowed to continue, serious infection may result. The best antidote is dry feet.

Similar exposure may cause salt water

boils or burns. An application of sulfanilamide ointment and bandaging is helpful. Squeezing or pricking is dangerous.

Aside from water, signaling equipment may be classed as the most important equipment (with the exception of the raft and life vest, of course). Without signaling equipment rescue is a mere chance.

The emergency radio set, which is provided with a hydrogen balloon and kite to raise the antenna, should be used constantly.

Very pistol and cartridges, signaling mirror and sea marker, if easily accessible, can be used on instant notice. Only a few minutes will elapse between the time a rescue plane is sighted and the time it disappears over the horizon. The Very pistol if fired before the plane is overhead can be seen from the pilot's compartment. If the plane is directly overhead, there is little likelihood that the pilot will see it.

The sea marker, if placed in the water at the first sound of the plane, will form a large greenish-yellow spot on the surface, making the position of the raft visible.

If the sun is out, the mirror or a bright piece of metal is the best bet. These mirrors, which bear instructions on the reverse side, can be seen by a plane ten to fifteen miles away.

Upon spotting the raft, the plane notifies rescue units and within a short time the raft occupants are headed back to base.

The procedure outlined for the B-17 applies in general to the B-24, B-25, B-26 and A-20, with the exception of crash positions and the exits through which they escape.

Due to difficulty in ditching the B-24, Liberator crews have been advised to bail out, using one-man dinghy parachute packs, wherever possible. If ditching is necessary, however, almost the same procedure is followed.

Procedures for ditching the A-20 recommend that the bombardier bail out since his position in the nose of the ship is considered dangerous, and he has no other exit.

As for the B-25, power-off at 2,000 feet must be maintained if the top turret gunner and radio operator are to climb over the bomb bay onto the flight deck.

Procedures suggested in posters being prepared by the Office of Flying Safety are recommended merely as a guide to ditching. Because plane models are constantly undergoing revision, pilots have been advised to adapt the practice to comply with the model being flown.

Since land planes are not designed for sea worthiness, success in every ditching cannot be guaranteed even if proper procedure is followed. However, constant drill in such procedure will assure personnel a greater chance of survival. ☆

# Roll of Honor

A MONTHLY RECORD OF DECORATIONS AWARDED  
TO PERSONNEL OF THE ARMY AIR FORCES

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Danver, Edison K., S/Sgt.  
(Also PH and AM with OLC)  
De Genaro, August V., Lieut.  
Duval, Jessie V., Lieut.  
(Also PH, DFC and AM with 3 OLC)  
Embree, Hoy D., S/Sgt.  
Forrest, Nathan Bedford, Brig. Gen.  
Gibson, Balfour C., Lieut.  
Harris, Arizona Todd, T/Sgt. (Also AM)  
Harrison, James A., S/Sgt.  
Johnson, Theron E., S/Sgt.  
Jones, William, Jr., Lieut.  
McGrath, Thomas J., S/Sgt.  
(Also PH and AM with 3 OLC)  
Vondrachek, Charles E., S/Sgt.

## DISTINGUISHED SERVICE MEDAL

Stratemeyer, George E., Maj. Gen.  
Vicciglio, Henry, Lieut. Col.

## LEGION OF MERIT

Amen, Henry J., Jr., Major  
Anderson, Frederick L., Jr., Brig. Gen.  
Bednarchuk, Antoni, S/Sgt.  
\*Braswell, John C., Lieut.  
Breene, Robert G., Maj. Gen.  
Carter, John F., Lieut.  
Connolly, Donald H., Maj. Gen.  
Daugherty, Joan H., Capt.  
Dawson, Thurman E., Lieut.  
Day, Jack E., W/O  
Fretz, Eugene J., Lieut.  
Gilardi, Albert J., Capt.  
Grow, Malcolm C., Col.  
Harmon, Hubert C., Maj. Gen.  
Hunter, Frank O'D., Brig. Gen.  
Jamison, Glen C., Brig. Gen. (Also DFC)  
Johnson, Robert J., Sgt.  
Lahm, Frank P., Brig. Gen.  
Loomis, Francis J., Maj.  
Maxwell, Warren A., Col.  
Monteverde, Armando L., Capt.  
McGinnis, Harold A., Col.  
Naurath, Howard M., Pvt.  
Redburn, Ralph A., Maj.  
Samford, John A., Col.  
Shafer, Robert H., Lieut.  
Smith, Albert D., Col.  
Snouffer, William N., Lieut. Col.  
Spencer, Harry E., Jr., Lieut.  
Spina, Paul J., Sgt.  
Stern, Benjamin, Brig. Gen.  
Strahm, Victor H., Brig. Gen.  
Sweetser, Luther W., Jr., Col. (Also AM)  
Towle, Stewart W., Jr., Col.  
Von Kohnitz, Alfred H., Maj.  
\*Walch, Felix J., Lieut.  
Walker, William J., M/Sgt.  
Wallis, Francis L., S/Sgt.  
Walsh, Robert L., Brig. Gen.  
\*Wedel, Clarence, Pvt.  
Wesley, Harold B., Capt.

## SILVER STAR

Abraham, George M., S/Sgt.  
Allen, Brooke E., Col.  
Andrews, Vernon E., S/Sgt.  
Arnone, Philip, S/Sgt.  
Austin, Gordon H., Col.  
(Also DFC and AM with 10 OLC)  
Ayres, James A., Pvt. (Also PH)  
Baker, Francis W., T/Sgt. (Also DFC and AM)  
Barnes, Roger T., S/Sgt. (Also AM)  
Barr, Edgar E., Lieut.  
Bartholomew, Victor H., Lieut.  
Bartlett, George H., Lieut.  
Bertram, William E., Lieut.  
Bills, Ralph C., Lieut.  
Block, Robert A., S/Sgt. (Also DFC)  
Botts, Jack H., S/Sgt.  
Brady, John M., Sgt.  
Brannan, Henry P., S/Sgt.  
Brinson, Sheldon S., Lieut.  
Broadwell, Walter J., Capt. (Also AM)  
Broman, Theodore H., Lieut.  
Brown, Barlow Dean, F/O  
Brum, Herbert L., T/Sgt. (Also AM)  
Castle, Frederic W., Col.  
De Shazo, Robert V., Lieut. Col.  
Dolph, Robert H., S/Sgt.  
Du Bois, Charles H., Jr., Lieut.  
(Also DFC and AM)  
Dyas, John R., Maj.  
Edwards, Theodore H., Sgt.  
Ferraiolo, Joseph, Sgt. (Also PH and DFC)  
Fincher, Deltis H., Lieut.  
Ford, V., Lieut.  
Gladhart, David F., Lieut.  
Gordon, Bobby H., Sgt.

Green, Malcolm, Jr., Lieut. Col.  
Hano, Frank C., Lieut.  
(Also PH, DFC and AM)  
Hanna, Walter J., Jr., Maj.  
Harding, Neil B., Col.  
Hill, Rowland G., Lieut.  
Hillis, Frank J., Lieut. Col.  
Hultgren, Russell L., Sgt.  
(Also DFC and 2 OLC to AM)  
Hunt, Jim H., Sgt.  
Jennings, Jack H., Lieut.  
Johnston, Richard B., Lieut.  
Jordan, Rufus E., Lieut.  
McClung, Robert A., Lieut.  
Meigs, Henry, Lieut.  
Melman, Bernard J., S/Sgt.  
Moore, Joseph F., Lieut.  
Murray, John S., Capt.  
Nutter, Sheldon H., Lieut.  
Olson, Harlan H., Lieut.  
Patterson, Phillip E., Sgt.  
Paynter, Maurice A., S/Sgt.  
Perry, Alan B., T/Sgt.  
Pettit, Robert L., Capt. (With OLC)  
\*Reed, Joseph C., Lieut. (Also Air Medal)  
Richardson, Roslyn C., S/Sgt.  
Ruiz, Ernest C., Lieut.  
Scholl, Walter, Jr., Capt.  
\*Shannon, Charles R., Lieut.  
Simmons, John C., Jr., Lieut.  
Skeldon, Joseph L., Lieut.  
Smyth, Glee G., Lieut.  
Terrell, Frederick R., Col.  
Turnbull, Robert J., Sgt.  
Vos, Eugene L., Sgt.  
Welch, Darrell G., Capt.  
Welch, Wilbert R., S/Sgt.  
Wilson, Delmar E., Lieut. Col.  
Wilson, Earl M., Lieut.  
Young, Franklin F., Lieut.

## PURPLE HEART

Ackridge, Leo C., Sgt.  
Anderson, Fred E., T/Sgt. (Also AM)  
Avery, Stephen M., Maj.  
Ballard, Frederick J., Cpl.  
\*Beasley, Leland V., Pvt.  
Bentley, William C., Col.  
\*Boyle, Arthur F., Pvt.  
Brainard, Ceylon H., Lieut.  
\*Brower, Rennie V., Jr., Pvt.  
Brown, Vincent Caylor, Lieut.  
(Also DFC and AM with 3 OLC)  
\*Carlson, Lawrence R., Pvt.  
\*Church, Leroy E., Pvt.  
Decker, Walter B., Lieut.  
Defenbaugh, Russell C., Pvt.  
\*Eichelberger, Paul R., Pvt.  
Land, George R., Jr., Lieut.  
\*Lango, Frank J., Pvt.  
McWilliams, Robert, Lieut.  
\*Malatak, Joseph, Pvt.  
Meyers, Harry M., S/Sgt. (Also AM)  
\*Moonhead, Lionel J., Pfc.  
\*O'Brien, Donald G., Lieut.  
\*Reece, Philip D., Lieut.  
Schatz, Jay J., G., Lieut.  
Schoenauer, Lyle, Lieut.  
\*South, Wilmer W., Pvt.  
\*Stockwell, Carey K., Pvt.  
\*Surrue, James F., Lieut. (Also AM)  
\*Taucher, Ben T., S/Sgt.  
Taylor, Paul R., S/Sgt.  
\*Tibbetts, Herman K., Pvt.  
\*Tuckerman, George W., Pvt.  
\*White, Joseph W., Sgt.  
\*Zappala, Joseph S., Pvt.

## SOLDIER'S MEDAL

Adams, Robert P., S/Sgt.  
Barrett, Jesse W., T/Sgt.  
Belenky, Eugene J., Sgt.  
Bicket, Paul W., T/Sgt.  
Blackman, Robert C., Lieut.  
Blessman, Roy F., Cpl.  
Broader, William E., Pvt.  
Bryson, Paul H., Pvt.  
Burkhart, Richard L., Pfc.  
Cordell, James E., Cpl.  
\*Demore, Mary H., Lieut.  
Elliot, Carl W., Pvt.  
Emminger, Jerry W., Sgt.  
Feather, William B., Sgt.  
Fink, Edwin D., S/Sgt.  
Fluharty, Wayne C., Pfc.  
Furland, Paul F., Cpl.  
Ganter, Eugene A., Pvt.  
Hessenflow, Edmond L., Pfc.  
Honea, Maurice L., Cpl.  
Huey, Glenn, Pfc.  
Kennedy, Arthur E., Lieut.  
Lewis, Jackson W., Capt.  
Lewis, John R., Cpl.  
Lundell, Harvey G., S/Sgt.  
Moenter, Joseph E., Pvt.  
McDaniel, Clyde W., Pvt.  
Newton, Robert E., Sgt.  
Niszczak, Joseph J., T/Sgt.  
Rawles, J. D., Sgt.  
Reeves, Vernon H., Lieut.  
Renna, Louis, Sgt.  
Sabo, Alexander B., W/O

Simon, Reuben, Lieut.  
Stowe, William A., Cpl.  
Streicher, Rufus E., Cpl.  
Sweet, Robert E., Lieut.  
Venturelli, Umberto, Col.  
Wallace, Patrick E., Pvt.  
Wexler, Nathan H., Capt.  
Woodrum, James, M/Sgt.

Adams, Ralph B., S/Sgt.  
Alexander, Ralph, S/Sgt. (Also AM)  
Ambrosius, William H., Capt.  
Anderson, Alf Lester, Cpl.  
Anderson, James A., Lieut. (Also AM)  
Armstrong, Ray W., T/Sgt. (With OLC)  
Baca, Max S., T/Sgt. (Also AM)  
Baker, Leonard, Capt. (Also AM)  
Baker, William V., S/Sgt.  
Ballentine, Henry R., T/Sgt. (Also AM)  
Ballantine, John V., Pvt.  
Barber, Bernard L., Lieut.  
Barefoot, Selwyn J., Capt.  
(Also AM with OLC)  
Barnes, James L., T/Sgt. (Also AM)  
Barnard, Francis Dewitt, Capt.  
Barnes, Albert H., S/Sgt. (Also AM)  
Barnes, Cecil G., Sgt. (Also AM)  
Barnes, Charlie, Sgt. (Also AM)  
Barnum, Burrall, Capt.  
Barr, Bernice S., Capt. (Also AM)  
Barton, James D., S/Sgt. (Also AM)  
Bates, James W., S/Sgt.  
Baynes, Edward E., S/Sgt. (Also AM)  
Bearden, R. T., S/Sgt. (Also AM)  
Benish, Robert J., Capt.  
(Also AM with OLC)  
Bentz, Edward K., Sgt. (Also AM)  
Berry, Robert, Lieut.  
Bickett, George L., Sgt. (Also AM)  
Bigham, James H., Cpl.  
Billings, Harry C., Jr., T/Sgt.  
Billingsley, Leonard, Lieut.  
Billmaier, Lawrence P., Cpl.  
Blanchard, Frederick W., M/Sgt.  
Blankenhorn, Charles, Jr., Capt.  
(Also AM)  
Bostwick, William E., Lieut. (Also AM)  
Bradford, William B., S/Sgt. (Also AM)  
Bradford, William R., Capt.  
Brazelton, Leonard G., Sgt.  
Brinkman, Willie E., Lieut.  
Brown, Elton D., Lieut. (Also AM)  
Brown, Lewellyn L., Lieut.  
Brown, Therman D., Capt. (Also AM)  
Brown, Vance, S/Sgt. (Also AM)  
Bryant, Olen C., Lieut. (Also AM)  
Burky, Claude N., Lieut. (Also AM)  
Burleinh, Albert H., Lieut.  
Burnett, Pelham R., Lieut.  
Bushee, Frank C., Lieut. (Also AM)  
Campbell, James E., Lieut.  
Campbell, William P., Lieut. (Also AM)  
Carr, W. J., Capt.  
Chandler, George W., Lieut. (Also AM)  
Chennault, Claire L., Maj. Gen.  
\*Christy, John V., Capt.  
Clayton, R. L., Capt.  
Clements, Pruitt L., T/Sgt.  
Cofe, J. W., Capt.  
\*Cominole, David, Lieut. (Also AM)  
Compton, Ruben C., T/Sgt.  
Crabtree, Dale E., Sgt. (Also AM)  
Crisp, Dennis, Capt.  
Davenport, John D., Lieut.  
Deans, E. G., Capt.  
Doan, Donald F., S/Sgt.  
Donovan, Charles Lane, Lieut.  
(Also AM)  
Dorband, Robert J., Sgt.  
Doty, Donald E., Sgt.  
Durham, Meredith E., T/Sgt. (Also AM)  
Eastus, Warden M., Cpl.  
Eckley, Paul W., Jr., Lieut. (Also AM)  
Edwards, Milton B., S/Sgt.  
Edwards, Samuel, S/Sgt.  
Eisenbrown, Walter Thomas, Lieut.  
(Also AM)  
Feitz, Maurice Stephen, Lieut.  
Feramisico, James, Sgt.  
Fetrow, Gene B., Capt.  
(Also 3rd OLC to AM)  
Filiogenzi, Mario J., S/Sgt. (Also AM)  
Flesher, Isaac A., S/Sgt.  
Fox, Leonard M., T/Sgt.  
Frederick, Harry R., Sgt.  
Garratt, John A., S/Sgt.  
(Also AM with 3 OLC)  
Glassburn, Kenneth L., Lieut. (With OLC)  
Glenn, Ralph E., Cpl.  
Glenn, Symie L., S/Sgt. (With AM)  
\*Gough, Albert, Capt.  
\*Hansen, James S., Lieut.  
Hanson, Paul, S/Sgt.  
Harrison, Arthur D., Sgt.  
Hastings, Richard, F/O  
Hawley, Daniel Charles, Lieut.  
Henriksen, Everett N., Lieut. (With OLC)  
Higgins, Clarence G., S/Sgt.  
Hinton, Percy M., Capt. (Also AM)  
Holsey, Raymond E., Lieut.

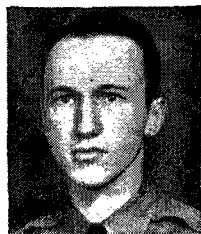
## DISTINGUISHED FLYING CROSS

Howk, Leon, Lieut. (Also AM)  
Huey, Stanley George, Maj. (Also AM)  
Hughley, Robert J., Maj. (Also AM)  
Humphries, John R., Jr., Lieut. (Also AM)  
Jackman, Robert J., S/Sgt.  
Johnson, Emil L., Lieut.  
Kersch, Conrad J., T/Sgt. (With OLC)  
Kerulis, John P., S/Sgt. (Also AM)  
Kicklighter, Conrad, Sgt.  
Kiger, Orville W., S/Sgt. (Also AM)  
Kocinas, Stanley J., Pvt.  
Krieg, Philip R., Capt.  
\*Laberge, Lawrence L., Lieut.  
Lanier, Fulton P., Lieut. (Also AM)  
Leland, Glen V., Jr., Lieut.  
Lenhardt, Edward J., S/Sgt.  
Lincoln, Wayne E., Cpl.  
Lindley, Harold O. R., S/Sgt.  
Londer, Maurice L., Sgt.  
(Also AM)  
Lowder, Guy M., Cpl.  
Lyons, George, Lieut.  
(Also AM)  
McBride, Charles R., Cpl.  
McClaran, Clarence E., Capt.  
McCoun, Gordon K., Lieut.  
McCullough, J. A., Lieut.  
McDevitt, Thomas E., Cpl.  
McGarry, Christian H., Lieut.  
McGrath, Thomas R., S/Sgt.  
McKenney, Louis V., Lieut.  
(Also AM)  
McRoberts, Ellsworth E., Lieut.  
(Also AM)  
Makela, John E., S/Sgt.  
(Also AM)  
Mallett, Frank, Sgt.  
Maulis, Nick, S/Sgt.  
Maxwell, Leo W., Jr., Capt.  
Menagh, William F., Lieut.  
(Also AM)  
Michael, Oliver C., Cpl.  
Miller, Donald C., Capt.  
(With OLC and AM)  
Mongan, Eddie M., Lieut.  
(Also AM)  
Moringstar, Joseph B., Lieut.  
Morris, Ralph T., Sgt.  
Morris, Robert F., S/Sgt.  
Morrison, William J., S/Sgt.  
Munson, Raymond G., Lieut.  
Murphy, Daniel J., S/Sgt.  
Nibley, Charles M., Sgt.  
Nice, Albert T., Lieut.  
(Also AM)  
Norgaard, Arthur E., S/Sgt.  
O'Donnell, John C., Lieut.  
Ogle, Kenneth L., Jr., Lieut.  
Olsen, Orwin S., Cpl.  
Ortiz, Cirilo D., Lieut.  
Osborne, Edward G., Sgt.  
(Also AM)  
Owen, John E., S/Sgt.  
Pacheco, Herman S., Jr., S/Sgt.  
Padgett, Cadman W., Lieut.  
(Also OLC to AM)  
Parsons, Hershel Echolt, Capt.  
Parsons, Levi E., Jr., Cpl.  
Peoples, Jack T., Capt.  
\*Phelan, Edward H., Jr., Lieut.  
Poole, Stanley, S/Sgt.  
(Also AM)  
Porter, William W., S/Sgt.  
Prince, Nathan D., Sgt.  
\*Probst, Victor V., T/Sgt.  
(Also AM)  
Proctor, Edwin Allen, Capt.  
Pylant, James H., Cpl.  
Rathbone, Francis S., Jr., Lieut.  
Rice, Leslie E., Lieut.  
Reid, Harland L., Lieut.  
Reynolds, Norris T., S/Sgt.  
(Also AM)  
Reynolds, Oneal S., T/Sgt.  
Rice, Charles D., Sgt.  
Richards, George M., Lieut.  
Rogers, Clarence, Cpl.  
Rohr, Victor E., Cpl.  
Rousset, Wilbur C., W/O  
(Also AM)  
Roy, Joseph S., Sgt.  
(Also AM with 3 OLC)  
Ryan, John L., Capt.  
Sage, William L., S/Sgt.  
(Also AM)  
Scarboro, Paul J., Lieut.  
(Also AM)  
Schadt, Martin M., T/Sgt.  
(Also AM)  
Scharp, Melvin C., S/Sgt.  
Schuffey, Merl H., Lieut.  
Schmidt, George W., Sgt.  
(Also AM)  
Schneider, Edwin A., Lieut.  
(With OLC)  
Sell, Ramon C., S/Sgt.  
Shaffer, Eugene D., T/Sgt.  
(Also AM)  
Shoberger, James F., Sgt.  
Shore, Walter G., Lieut.  
(Also AM)  
Silby, Edward M., S/Sgt.  
Slater, Richard L., Sgt.  
Smart, Clare M., Lieut.  
\*Smith, Fred M., Capt.  
(With OLC)

\* Posthumous  
† Air Carrier Contract Personnel, ATG



Lt. P. H. Daniels, 3d



Capt. Leonadis Baker



Lt. Maurice S. Feltz



Lt. Floyd S. Funk



Col. W. C. Bentley



T/S J. H. Thornton

Smith, Ray J., S/Sgt.  
 Smith, William C., S/Sgt.  
 Snyder, Delmer S., S/Sgt.  
 Staples, George M., Lieut.  
 Stearns, Willard R., Lieut.  
 Stein, Edward G., Cpl.  
 Steiner, Albert A., Lieut.  
 Stephens, Maurice L., Capt.  
 Stipech, Frank R., Sgt.  
 Starr, Harold J., Sgt.  
 Stitt, Austin W., Jr., Capt.  
 (Also AM)  
 Stone, Elmer Jackson, Lieut.  
 Stoverm, George E., Lieut.  
 Sullivan, Lorry, Lieut.  
 Sullivan, John F., Capt.  
 Taylor, Homer R., Lieut.  
 Thall, Edward, Cpl.  
 Thorne, Ola P., Capt.  
 Turner, Kenneth H., Capt.  
 Uechurch, Gaston R., T/Sgt.  
 Urban, Harry, M/Sgt.  
 Wagner, Willis F., Lieut.  
 (Also AM)  
 Walker, Talmadge E., Lieut.  
 Walsh, James F., S/Sgt.  
 Watkins, Harvey O., Jr., Sgt.  
 West, William G., Cpl.  
 Whitehead, Charles D., Sgt.  
 Whitman, William B., S/Sgt.  
 Wise, John W., Lieut.  
 Woods, Merle C., Lieut.  
 (Also AM)  
 Zatzke, Frank W., Lieut.  
 (Also AM)  
 Zeamer, Jay, Capt.

## OAK LEAF CLUSTER TO DISTINGUISHED FLYING CROSS

Casper, Kenneth D., Maj.  
 (Also AM)  
 Cottage, Stanley, Lieut.  
 (Also AM)  
 Ford, Emmette W., Lieut.  
 (Also AM)  
 Geckeler, John M., Lieut.  
 (Also AM)  
 Griffin, William J. P., M/Sgt.  
 (Also AM)  
 Payne, Conrad R., Lieut.  
 (Also AM)  
 Tarbutton, Paul R., Capt. (2nd)  
 Vail, Raymond M., Sgt.  
 Wallach, John A., Lieut.  
 (Also AM)  
 White, Herbert C., Jr., Lieut.  
 Wiest, Herbert E., Lieut.  
 (Also AM)

## AIR MEDAL

Agee, James R., Sgt.  
 (With OLC)  
 Akes, Charles D., Pfc.  
 Alderson, Robert H., S/Sgt.  
 Alison, John R., Lieut. Col.  
 Alleman, Charles R., Sgt.  
 Allen, William, Sgt.  
 Allison, Otis E., Lieut.  
 (With 2 OLC)  
 Ames, Robert G., Sgt.  
 Anderson, Samuel H., Lieut.  
 (With 2 OLC)  
 Anderson, William M., Lieut.  
 Andrews, Norman L., Lieut.  
 Apple, Frank H., S/Sgt.  
 Ard, Gilbert H., Sgt.  
 Armstrong, Robert, Lieut.  
 Arnold, Rupert W., S/Sgt.  
 Arsenaull, Lawrence J., S/Sgt.  
 Ascoli, Hollet, S/Sgt.  
 Auger, Clifford M., Pvt.  
 Avdeich, Fillmore, Lieut.  
 Bailey, William A., Jr., Capt.  
 Baker, Edwin C., Capt.  
 Baldassare, Walter, Sgt.

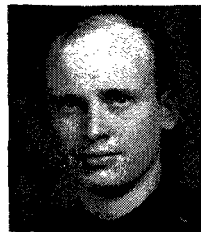
Beringer, John L., S/Sgt.  
 Berry, Houston B., S/Sgt.  
 Bevan, Donald J., Sgt.  
 (With 3 OLC)  
 Biggers, Charles E., Lieut.  
 Biggs, Albert C., Lieut.  
 Bird, Clement W., Lieut.  
 Birdson, George P., Lieut.  
 Blackwell, Westley V., S/Sgt.  
 Blake, Robert C., S/Sgt.  
 (With OLC)  
 Blanchard, George W., Lieut.  
 Bloomfield, Thomas F., Lieut.  
 Blum, Edward F., Lieut.  
 Boehm, Walter, Sgt.  
 Robert, William D., Sgt.  
 Bohlen, Dean W., Lieut.  
 (With OLC)  
 Bolle, Norman N. V., Lieut.  
 (With OLC)  
 Boluch, Stephen, Lieut.  
 Bone, Jim K., Lieut.  
 Boney, Warren X., Lieut.  
 Bonthie, Harry J., Lieut.  
 (With 3 OLC)  
 Borostowski, Benedict B., T/Sgt.  
 Borowsky, Joshua, Sgt.  
 Bowie, Donald B., S/Sgt.  
 Bowman, Horace D., Lieut.  
 Bowman, John Poole, Lieut.  
 Boylan, George S., Jr., Lieut.  
 Brady, John B., Capt.  
 Brandt, Waldo B., S/Sgt.  
 (With OLC)  
 Bragg, Kendrick, Lieut.  
 (With 3 OLC)  
 Brannon, Joseph W., Sgt.  
 Breunig, Wilbur W., Lieut.  
 Brewster, Edward M., Lieut.  
 Brodsky, Edward J., Lieut.  
 Brookhart, Joseph, Lieut.  
 Broussard, Eddie J., Capt.  
 Brousseau, Andre R., Maj.  
 Brown, J. E., ATC  
 Brown, Willard L., Lieut.  
 Bruckheimer, David, Lieut.  
 Brumett, Lee S., Sgt.  
 (With 2 OLC)  
 Buckner, Kermit C., S/Sgt.  
 Burns, Francis J., S/Sgt.  
 Burnstad, Basil B., Lieut.  
 (With OLC)  
 Bush, Edwin R., Lieut.  
 Caiavano, Albert F., Sgt.  
 Campbell, Robert B., Capt.  
 Canham, Arthur Eldridge, Lieut.  
 (With 2 OLC)  
 Carboni, Dominick, Sgt.  
 Carney, Arthur O., Sgt.  
 Carr, Joseph P., Lieut.  
 (With OLC)  
 Carter, Arthur C., Lieut.  
 Chesser, Robert E., Lieut.  
 Christy, Charles W., Lieut.  
 Clancy, William E., Capt.  
 Clark, Roderick C., S/Sgt.  
 Clifton, Raymond C., T/Sgt.  
 Clymer, Gerald F., Lieut.  
 (With OLC)  
 Coates, Darrell W., S/Sgt.  
 Colantoni, William, Lieut.  
 Combs, Mack, Sgt.  
 Conner, William H., Lieut.  
 (With 2 OLC)  
 Cook, Emmett G., Lieut.  
 Cook, Warren G., Sgt.  
 Cooke, Charles J., Lieut.  
 Courtney, Clyde Thomas, Sgt.  
 Cox, Burton D., Lieut.  
 Coyle, Gervais G., Lieut.  
 Grandali, Arthur L., S/Sgt.  
 Crane, John E., Lieut.  
 Cranmer, Edwin A., Lieut.  
 Crichton, Douglas E., Lieut.  
 Croon, Richard D., S/Sgt.  
 (With OLC)  
 Crouch, Horace E., Capt.  
 Cruikshank, Arthur W., Jr., Lieut.  
 Cummings, Duke D., Lieut.  
 (With OLC)  
 Curtis, Ferd J., Lieut.  
 Curtis, Frazier, Lieut.

Dalton, Dean H., Lieut.  
 Damaske, Marvin L., T/Sgt.  
 Daniels, James J., Sgt.  
 Daniels, Patrick H., III, Lieut.  
 Darden, James H., Lieut.  
 Dasher, Everett A., T/Sgt.  
 Davidson, John F., ATC  
 Davis, Charles J., S/Sgt.  
 Davis, Charles M., S/Sgt.  
 Davis, Elvin Albert, S/Sgt.  
 (With OLC)  
 Davis, Gene F., Lieut.  
 Davis, Robert E., Lieut.  
 Day, Donald E., S/Sgt.  
 Dayley, Burns Richard, S/Sgt.  
 Dean, George B., Lieut.  
 Deboy, Peter F., T/Sgt.  
 DeBusk, James H., Sgt.  
 Decker, Kenneth R., Sgt.  
 Dennis, Stephen C., Lieut.  
 Depke, Robert W., Lieut.  
 Derr, Ernest W., S/Sgt.  
 Dexter, John H., Lieut.  
 Dick, Charles S., Sgt.  
 Dobson, Eugene H., S/Sgt.  
 Dowd, William H., Lieut.  
 Downs, Emory M., Lieut.  
 Drake, Carl H., Sgt.  
 Drake, Clarence H., Lieut.  
 Dreher, John S., Lieut.  
 Dudeck, Edward J., Lieut.  
 Dunham, Volla A., Jr., Lieut.  
 Dustin, Kenneth H., Lieut.  
 Eareckson, William O., Col.  
 Edward, James O., S/Sgt.  
 (With 2 OLC)  
 Edwards, Lyle V., T/Sgt.  
 Ehrhardt, Clark A., S/Sgt.  
 Edson, Jordan B., Sgt.  
 Elledge, Raymond P., Lieut.  
 Elliot, Wilson C., S/Sgt.  
 Embach, John W., Lieut.  
 Emerson, Arthur R., Lieut.  
 Emery, Albert W., T/Sgt.  
 Epperson, Malcolm N., S/Sgt.  
 Esnailier, Eddie F., T/Sgt.  
 Evans, Frank B., Lieut.  
 (With 2 OLC)  
 Farnworth, Stanley L., S/Sgt.  
 Farrar, John W., Lieut.  
 Ferguson, John S., Sgt.  
 Ferrara, John C., Lieut.  
 (With OLC)  
 Ficeto, Bartholomeo Tony, Sgt.  
 (With OLC)  
 Finneburgh, Edward I., Lieut.  
 Finney, George R., Sgt.  
 Fitzgerald, Robert J., S/Sgt.  
 Fleming, Eugene B., Sgt.  
 (With 3 OLC)  
 Fonorow, Milton S., Lieut.  
 Ford, William A., Jr., S/Sgt.  
 Fore, DeWitt G., S/Sgt.  
 Fortin, Raymond W., Lieut.  
 Fowler, Raymond B., Lieut.  
 Fox, Gayle S., Lieut.  
 Frelich, Gerald C., Sgt.  
 Frieholz, John T., T/Sgt.  
 Fulton, Frederick Peter, Lieut.  
 Funk, Floyd S., Lieut.  
 Gable, Clark, Capt.  
 Gannon, James F., Sgt.  
 Garner, Stanley C., T/Sgt.  
 Garrett, Wilmer J., Lieut.  
 Gates, Frank A., T/Sgt.  
 Gillogly, Fred D., Lieut.  
 Gilman, Mark H., Lieut.  
 Gilroy, Walter E., T/Sgt.  
 Gipple, Harvey W., Sgt.  
 Glover, Harold Elmer, S/Sgt.  
 (With 2 OLC)  
 Good, George E., Lieut.  
 Goodrich, Miles C., M/Sgt.  
 Graddy, William C., S/Sgt.  
 Grainger, James R., S/Sgt.  
 Granoff, John H., Sgt.  
 Grant, Reginald D., Lieut.  
 Graves, Alvin L., Lieut.  
 Gray, Decker J., Jr., S/Sgt.  
 Green, George L., Sgt.

Green, William A., T/Sgt.  
 Greene, Donald R., Lieut.  
 (With OLC)  
 Grell, Gerald C., Lieut.  
 Greve, Thomas E., Lieut.  
 Grisonis, Nickolas C., S/Sgt.  
 Gross, Gale H., Sgt.  
 Grube, Willie W., Lieut.  
 Guthrie, Allen S., Pfc.  
 Haas, Joseph E., Lieut.  
 Hagenbuch, Glenn E., Capt.  
 Hails, Clair D., S/Sgt.  
 Hale, Zeffra I., Capt.  
 Hamilton, Joseph L., Lieut.  
 Hamilton, Linton D., Lieut.  
 Hamilton, Robert A., Sgt.  
 Hammer, Arthur J., Lieut.  
 Hancock, Robert E., A/C  
 Hanks, Joseph D., S/Sgt.  
 Hansbury, Thomas J., S/Sgt.  
 Hansen, Dale W., S/Sgt.  
 (With OLC)  
 Hardwick, James W., Lieut.  
 Harmon, Edward Z., Sgt.  
 Harris, Francis H., Capt.  
 Harris, Maurice L., Sgt.  
 Harris, Reginald G., S/Sgt.  
 (With OLC)  
 Hart, James C., Lieut.  
 Hartman, William J., Lieut.  
 Harvey, Herbert H., T/Sgt.  
 Harvey, John F., Lieut.  
 Hatleberg, Maynard M., T/Sgt.  
 Hay, James B., ATC  
 Haynes, Roy R., Sgt.  
 Hays, Marlborough L., Sgt.  
 Haywood, James W., S/Sgt.  
 Hazleton, Walter L., S/Sgt.  
 (With OLC)  
 Heap, Howard A., S/Sgt.  
 Hubbard, Henry F., Lieut.  
 Hubbard, Olan L., Lieut.  
 Hudson, Henry D., Lieut.  
 Huggins, Harry W., Sgt.  
 Hughes, Aquilla B., Jr., Capt.  
 Hughes, Septimus R., Lieut.  
 Humphries, Bert W., Lieut.  
 (With OLC)  
 Hunt, William Louis, Lieut.  
 Hurlbert, Norman F., S/Sgt.  
 Hussleton, John W., S/Sgt.  
 Hutson, Joseph T., T/Sgt.  
 (With 2 OLC)  
 Hutter, William B., T/Sgt.  
 Hutton, John N., Lieut.  
 Ingram, Donald H., S/Sgt.  
 Isbell, James A., Lieut.  
 Jacknik, Frank J., Lieut.  
 Jackson, Everett C., S/Sgt.  
 Jefferson, Harley W., Lieut.  
 Jeffries, Oren L., Lieut.  
 Jester, Donald E., S/Sgt.  
 Joffrion, Joseph S., S/Sgt.  
 Johns, Malcolm B., S/Sgt.  
 Johnson, Billy S., S/Sgt.  
 Johnson, Charles C., S/Sgt.  
 Johnson, Gerald R., Lieut.  
 (With OLC)  
 Johnson, Grove C., Lieut.  
 Jones, Gerald H., Sgt.  
 Jordan, Roy E., Sgt.  
 Joslin, John W., Lieut.  
 Jostenski, Robert B., Lieut.  
 Karanson, William A., Jr., S/Sgt.  
 Keen, William R., Sgt.  
 Keenan, James H., Capt.  
 Kehoe, Nicholas B., Jr., Lieut.  
 Kissenbarth, Stanley N., Lieut.  
 Kitzman, Gordon A., Lieut.  
 Klig, Lester G., Sgt.  
 Knapel, George C., M/Sgt.  
 Kripner, Howard L., Lieut.  
 Kruszynski, Gerald J., T/Sgt.  
 (With OLC)  
 Kuhn, Merton, T/Sgt.  
 Kuenning, Thomas E., Lieut.  
 Kulchesky, Harry, S/Sgt.  
 Kurtenbach, Kenneth J., S/Sgt.  
 Kuzdrall, Anthony A., M/Sgt.  
 (With OLC)  
 Kwassneske, Henry J., S/Sgt.  
 (Continued on next page)



Capt. J. H. Keenan



Lt. Robert A. McClung



Lt. Claude N. Burcky



Lt. Deltis H. Fincher



Capt. G. Davidson, Jr.



Lt. John R. Humphries

# Roll of Honor

A MONTHLY RECORD OF DECORATIONS AWARDED  
TO PERSONNEL OF THE ARMY AIR FORCES

Lawson, Clarence V., Lieut.  
Leary, Edward J., Sgt.  
Leasure, William C., Lieut.  
Leucy, Orval E., S/Sgt.  
Lee, James F., Lieut.  
Leeker, Walter C., Lieut.  
Leines, Harold Jerome, S/Sgt.  
Leow, Richard E., Lieut.  
Lewis, Grant R., S/Sgt.  
(With OLC)  
Lipe, Fort W., Lieut.  
Lockhart, Russell D., Lieut.  
Loewecke, William E., Lieut.  
(With OLC)  
Long, Alan W., Capt.  
Long, Winfield V., S/Sgt.  
Lowery, Glen F., Lieut.  
Lubner, Martin M., Lieut.  
Lucas, Jack, Sgt.  
Ludlow, Jack, Lieut.  
(With 2 OLC)  
Ludolph, George L., Lieut.  
Ludwig, William R., Capt.  
Lugasewitz, Julius V., Sgt.  
Lundy, James T., Lieut.  
(With OLC)  
Lunsford, Hoyt H., Lieut.  
Luschen, Charles R., Lieut.  
Luther, Martin, Lieut.  
(With OLC)  
Lutz, John R., Lieut.  
Lyle, Lewis E., Capt.  
Lyman, Thomas G., Lieut.  
Lynch, Joseph, S/Sgt.  
MacDonald, Donald R., Maj.  
McAdams, Lee D., Jr., S/Sgt.  
McArthur, T. H., Capt.  
McCabe, Kenneth C., Sgt.  
McCarthy, Eugene J., Capt.  
McCarthy, Martin W., Jr., Lieut.  
McCauley, Anthony C., S/Sgt.  
McCord, Robert R., Lieut.  
McCurdy, Arthur, Lieut.  
McDaniel, Abner O., Lieut.  
McDonald, Robert Lewis, Lieut.  
McDonnell, Walter S., Lieut.  
McDonnell, William J., Sgt.  
McEntire, Bruce M., Lieut.  
McFerrin, Jesse W., Lieut.  
McGahan, Chester, Lieut.  
McGehee, Thomas K., Maj.  
McGill, Woodrow M., Lieut.  
McKay, Mack, Capt.  
McKee, Carrick, S/Sgt.  
McKelvey, Van Dyke, Lieut.  
McKesson, Lewis R., Lieut.  
McKinnon, Frederick W., Jr., Lieut.  
†McMakin, Ralph A., ATC  
McWilliams, Major H., Lieut.  
Magee, Roland, S/Sgt.  
Mahan, Lloyd J., S/Sgt.  
(With OLC)  
May, Chester H., Lieut.  
May, John W., Sgt.  
May, Otis W., Lieut.  
Mayotte, Robert A., T/Sgt.  
Means, Lucian W., Jr., T/Sgt.  
Meaux, Allan F., S/Sgt.  
Meheles, John, S/Sgt.  
Melton, Robert E., Lieut.  
Mendenhall, Dean, Lieut.  
Meyer, Charles F., Lieut.  
Middleton, Paula Mathew, Lieut.  
(With OLC)  
Migdat, Walter M., S/Sgt.  
Miller, Norris C., T/Sgt.  
Miller, Robert C., Lieut.  
Milliner, James H., S/Sgt.  
Mills, Hawley Pierce, Lieut.  
Milnes, Arthur C., Sgt.  
Miser, Harry D., S/Sgt.  
Mitchell, Anthony B., Lieut.  
Mock, Jacob S., Jr., Sgt.  
Moffler, William A., S/Sgt.  
(With OLC)  
Mohr, Homer H., Lieut.  
Monaghan, Bernard I., Cpl.  
Monroe, Rayford L., T/Sgt.  
Moon, Billy E., Lieut.  
Moore, Albert K., Lieut.  
Moore, Donald M., Lieut.  
Moore, Leonard J., Lieut.  
Moore, Robert T., Sgt.  
Moore, Wilson, Capt.  
Moorer, William G., Lieut.  
Morgan, Robert, S/Sgt.  
Morgan, Robert K., Capt.  
Morrison, Samuel M., Sgt.  
Moser, George R., Lieut.  
Muldoon, Bernard R., Lieut.  
Mulligan, James C., S/Sgt.  
Mullin, Evrette J., Jr., Lieut.  
(With OLC)  
Mulvana, John B., Lieut.  
Murphy, William F., S/Sgt.

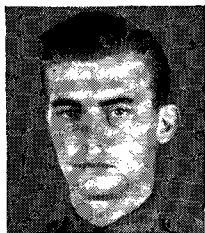
Murphy, Kimmel P., Capt.  
Murray, Gilbert A., S/Sgt.  
(With OLC)  
Naismith, Robert E., Lieut.  
Nall, Charles C., Cpl.  
Nance, Clifford P., S/Sgt.  
Nardine, Howard H., S/Sgt.  
(With OLC)  
Nease, Charles M., Sgt.  
Nelson, Norman R., Lieut.  
Newman, Fred J., Sgt.  
Nichols, Edgar S., S/Sgt.  
Nielsen, Leland C., Lieut.  
Nivner, Keith M., S/Sgt.  
(With OLC)  
Nold, Woodrow V., Capt.  
Notthstein, Howard, S/Sgt.  
Nysteen, Norman A., Lieut.  
O'Brien, Leonard H., Sgt.  
Ochsner, Leo A., S/Sgt.  
Odell, Edward N., Lieut.  
Ogan, Wilson E., T/Sgt.  
Olds, Sherwood W., Lieut.  
Oliver, Ralph L., Maj.  
Orchard, William, Capt.  
Ormand, Waverly C., T/Sgt.  
Orris, Harry F., S/Sgt.  
Pack, Lawrence B., Lieut.  
Pack, James L., S/Sgt.  
Padgett, Charles A., Lieut.  
Paine, Charles J., Lieut.  
Pennington, James L., Sgt.  
Pennoyer, Jordan M., Lieut.  
Perkins, Charles B., Sgt.  
Perry, William W., Capt.  
(With OLC)  
Peterson, Herbert M., Sgt.  
Peterson, Richard A., S/Sgt.  
Peterson, Warren C., Capt.  
Peycock, Thomas R., Sgt.  
Phillips, Charles R., Lieut.  
Phillips, Reginald H., Lieut.  
Pietrowski, Walter, S/Sgt.  
(With OLC)  
Plaschke, Kermit R., S/Sgt.  
Plecha, Stanley L., Lieut.  
Ploeger, Roy L., M/Sgt.  
Polhamus, Floyd C., S/Sgt.  
Porter, Lambert C., Lieut.  
Powell, John F., S/Sgt.  
(With 2 OLC)  
Powers, John D., Lieut.  
Prall, George L., Pvt.  
Prescott, Paul H., S/Sgt.  
Price, Jerald C., Capt.  
Prichard, Jarvis B., Lieut.  
Prieston, George E., Capt.  
Pritsky, Joseph J., Lieut.  
Pruitt, Elliott C., Lieut.  
Purdy, Norman E., Lieut.  
Quickel, Cortez S., Lieut.  
Quinn, John J., Lieut.  
Rabinowitz, Harry, Cpl.  
Rabo, Fred A., Lieut.  
Ragland, William A., Lieut.  
Rallo, Jacob W., S/Sgt.  
Ramputi, Frederick R., Lieut.  
Rand, Claude M., Sgt.  
Raymer, Winston C., S/Sgt.  
Rebello, Francisco, Sgt.  
Reeder, Jack D., Capt.  
Regan, James, Lieut.  
Reigh, Carl B., Cpl.  
Rethman, Vincent C., Lieut.  
Rex, John L., Jr., Lieut.  
Reynolds, Joseph C., Lieut.  
Ribeck, Joseph, Sgt.  
Ridnour, Gerald J., Sgt.  
Riechers, Delbert W., Sgt.  
Rieman, Robert R., Lieut.  
Roberts, Wallace M., S/Sgt.  
Robertson, Arthur B., Jr., Lieut.  
(With OLC)  
Robinson, Richard R., S/Sgt.  
Rooney, John W., Lieut.  
Roder, Helmut V., S/Sgt.  
Roitsch, Clarence A., Lieut.  
Roll, Leland S., Lieut.  
(With OLC)  
Roake, Walker, Capt.  
Rooney, John W., Lieut.  
Roosen, Edwin C., Lieut.  
Roth, Charles L., S/Sgt.  
Rouse, Arthur, Jr., Lieut.  
Roviaro, Ermando P., S/Sgt.  
Rowland, Daniel W., S/Sgt.  
Rukes, Marilyn D., S/Sgt.  
Ruppenthal, John J., Lieut.  
(With OLC)  
Ruse, John C., Capt.  
Russell, Roy C., Lieut.  
Ryan, James A., Lieut.  
Sagnihene, Charles V., S/Sgt.  
Salitnik, Robert J., Lieut.  
Sanderson, Ellis J., Lieut.

Sauer, Robert R., Lieut.  
Savage, Francis E., Lieut.  
Sawyer, William F., Lieut.  
Saylor, George R., T/Sgt.  
Scannell, Joseph W., Lieut.  
Schafer, Robert T., S/Sgt.  
Schepis, Thomas F., Lieut.  
(With OLC)  
Schmidt, William J., Lieut.  
Schmitz, Leonard, Sgt.  
Schneiderman, Henry C., S/Sgt.  
Schwendiman, Ray J., Lieut.  
Scott, John W., Lieut.  
Sedore, Richard S., Sgt.  
(With OLC)  
Sennott, William J., Jr., Sgt.  
Sentz, Vernon R., S/Sgt.  
Setzer, Marvin J., Lieut.  
Sgroi, Anthony, Lieut.  
Shaeffer, Earl A., Lieut.  
(With OLC)  
Sharp, Budrow C., S/Sgt.  
Sharp, Frank D., Maj.  
Shaw, Roger T., Lieut.  
Shelfer, Edward P., Pic.  
Shepard, William G., Capt.  
Sherwood, Lyle D., Lieut.  
Shirley, Homer C., Lieut.  
Short, Willard K., Lieut.  
Sibbold, George G., S/Sgt.  
Siboski, William R., S/Sgt.  
Siler, Stanton T., Sgt.  
Silk, Lawrence J., Jr., Sgt.  
Simmons, Herbert W., Lieut.  
Simmons, Hylan V., S/Sgt.  
Simons, Raymond L., T/Sgt.  
Singletery, Harold C., S/Sgt.  
Skip, Francis J., Lieut.  
Stankard, Paul B., S/Sgt.  
Slater, Carl W., Sgt.  
(With OLC)  
Sledd, Claude, Jr., Capt.  
Sloan, Charles R., Lieut.  
Sloan, George E., Lieut.  
Sloan, William J., Lieut.  
Small, Mitchell, Sgt.  
Smart, James L., Lieut.  
Smith, Albert G., Lieut.  
Smith, Darwin N., Sgt.  
Smith, Edward H., Sgt.  
Smith, George W., ATC  
Smith, John R., Lieut.  
Smith, John W., Lieut.  
Smith, Joseph Russell, Lieut.  
Smith, Lemuel B., Lieut.  
(With OLC)  
Smith, Merle Elmer, Lieut.  
Smith, Richard L., Sgt.  
Smith, Robert W., Lieut.  
Smith, Sidney T., Capt.  
Sommer, Marcel W., S/Sgt.  
Soria, Peter, Sgt.  
Soup, John R., Lieut.  
Spring, Gilbert M., Lieut.  
Spurrier, Odith K., Lieut.  
Stage, Albert Ames, S/Sgt.  
(With OLC)  
Stainick, Samuel, Lieut.  
Stamatelos, Pete D., S/Sgt.  
Stampton, Peter J., Lieut.  
Stanek, Bernard J., Lieut.  
Stappler, Robert F., Lieut.  
(With OLC)  
Starbuck, James H., Maj.  
(With OLC)  
Steele, Earl A., Lieut.  
Stein, Eugene H., S/Sgt.  
(With OLC)  
Steiner, Irwin O., Lieut.  
Stellhorn, Bernard A., S/Sgt.  
Stephens, Nelson M., S/Sgt.  
Stephey, Harry M., Lieut.  
(With OLC)  
Stevens, David M., Lieut.  
Stockard, Luther B., Lieut.  
Stokes, Woodrow H., Lieut.  
Storey, Seely M., S/Sgt.  
Stout, George A., Lieut.  
Stover, Glenn R., Lieut.  
Strauss, Kenneth R., Lieut.  
Stuart, Harold K., Lieut.  
Stupelli, Harvey L., Sgt.  
Swais, John, Capt.  
Swenson, Donald A., Lieut.  
Swinney, James W., S/Sgt.  
Sylvester, Joseph J., Lieut.  
(With OLC)  
Taylor, Albert D., Sgt.  
Taylor, John J., Lieut.  
(With OLC)  
Taylor, Walter R., T/Sgt.  
Tedder, John G., Cpl.  
Thomas, Homer E., Lieut.  
Thomas, Jerry E., Lieut.  
(With OLC)  
Thomas, Reuben L., Jr., Lieut.  
Thompson, Charles S., Jr., Lieut.  
Thompson, Clyde A., Lieut.  
Thompson, Garnett B., Sgt.  
Thompson, James D., S/Sgt.  
Thompson, Norman L., S/Sgt.  
Thompson, Thomas E., Cpl.  
Thomson, John A., Lieut.  
Thornbury, Edward M., Lieut.

Thornton, James Henry, T/Sgt.  
(With OLC)  
Tidwell, John L., Sgt.  
Tolar, Robert F., S/Sgt.  
Tracy, George A., S/Sgt.  
Trankle, Herbert B., Lieut.  
Trimpe, Melvin J., Lieut.  
Tudor, James R., Lieut.  
(With OLC)  
Twigg, George S., Lieut.  
Uhle, Richard B., Lieut.  
Ulrich, Chester S., Sgt.  
Vance, Kenneth M., Sgt.  
Vanderneck, Richard V., T/Sgt.  
Van Lear, Harry P., Jr., Lieut.  
Varnado, Marvin E., Sgt.  
Vaughn, Aubrey R., S/Sgt.  
Verinis, James A., Lieut.  
Waggoner, Wetsel D., Lieut.  
Wagner, Walter A., Jr., Lieut.  
Waldroup, Marvin M., Lieut.  
Walker, Robert K., Lieut.  
Wallace, Robert E., Sgt.  
Wann, Harry A., Lieut.  
(With OLC)  
Ward, Arthur N., Jr., S/Sgt.  
(With 2 OLC)  
Ward, Grady B., Lieut.  
Ware, John F., Lieut.  
Warner, Harold W., S/Sgt.  
Warner, James R., Maj.  
Watkins, Percy B., Lieut.  
Watts, Escar, Jr., Capt.  
Weamer, Raymond P., Lieut.  
Webb, Kenneth C., T/Sgt.  
Weed, Charles H., Lieut.  
Weeks, Murry E., Lieut.  
Weiss, Charles, Lieut.  
Welch, Edwin L., T/Sgt.  
Weniger, Alfred M., M/Sgt.  
Werner, Miles A., Lieut.  
(With 2 OLC)  
Wertz, Wayne E., Sgt.  
White, Jack C., Lieut.  
White, Thomas A., Lieut.  
(With OLC)  
White, Thomas R., Jr., S/Sgt.  
Whitman, Jack W., S/Sgt.  
Wilke, Linn E., Jr., Lieut.  
Willson, Martin E., Capt.  
Wilkinson, Douglas, S/Sgt.  
Wilkinson, William R., S/Sgt.  
Williams, Edwin Warner, Lieut.  
(With OLC)  
Williams, Leon, S/Sgt.  
Williams, Walter A., Lieut.  
Williams, Walter M., Col.  
Willis, Boyce B., Cpl.  
Wilson, Nunnary, Lieut.  
\*Wilson, Owen T., S/Sgt.  
Wilson, Ray, Jr., Lieut.  
Wingfield, Robert L., Lieut.  
Wintermoyer, Hugh C., T/Sgt.  
(With OLC)  
Winzer, Ted M., Lieut.  
Witsold, Edward F., Jr., Lieut.  
Wolfe, Fred J., Lieut.  
Wood, Charles L., Jr., Sgt.  
Wood, John R., S/Sgt.  
(With OLC)  
Woodfolk, Edmund T., Lieut.  
Wright, Leo R., S/Sgt.  
Wright, Robert H., S/Sgt.  
Wyler, William, Maj.  
Wyly, Glen R., S/Sgt.  
Wynn, Walter L., S/Sgt.  
Yaussi, Frank D., Lieut.  
Zahos, George E., Lieut.  
Zeigler, Philip R., Capt.  
Zelasney, Edward J., S/Sgt.  
(With 2 OLC)  
Zick, Marvin D., Lieut.  
Ziemer, Frederick B., T/Sgt.  
Zinkovich, Michael C., Lieut.

## OAK LEAF CLUSTERS TO AIR MEDAL

Altman, Fredric G., Lieut. (2nd)  
Alvey, Joseph R., S/Sgt. (3rd)  
Anderson, Roland V., Sgt. (2nd)  
Anderson, Stanley M., Lieut. (3rd)  
Art, Robert J., Lieut. (3rd)  
Bagwell, Leon L., S/Sgt. (2nd)  
Balaban, John A., Lieut. (2nd)  
Bishop, Warren Riley, Sgt.  
Robinski, Henry P., Sgt.  
Boyd, James R., Sgt. (4th)  
Browe, Robert E., Sgt.  
Carlson, Francis B., Maj.  
Davidson, George H., Jr., Capt.  
Forrester, William H., S/Sgt.  
Gibson, Roy H., S/Sgt.  
\*Grubb, Gerald L., T/Sgt.  
McMahon, Thomas D., Sgt.  
Nisbett, William L., T/Sgt.  
Rumph, Duane W., Sgt.  
Shearer, John H., Sgt.  
Shoemaker, William G., Lieut.  
Stampley, Clarence R., Lieut.  
Williams, William E., S/Sgt. ☆



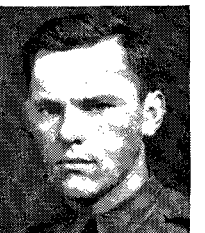
Lt. Clarence H. Drake



Col. Brooke E. Allen



Lt. K. L. Glassburn



Capt. Dennis Crisp



Col. W. O. Eareckson

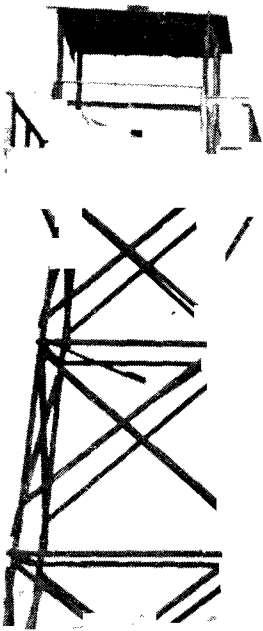


Lt. Oren L. Jeffries



# HENDERSON TOWER

The old tower, partially dismantled.



By Capt. J. E. ROBERTS  
and  
Staff Sgt. JOHN R. DUNN  
ARMY AIRWAYS  
COMMUNICATIONS SYSTEM

*Henderson Field on Guadalcanal isn't what it used to be. The wail of the air raid siren is more of an event now; Jap bodies no longer lie around to smell up the place. Most important of all, supplies have come in—supplies that make Henderson look like one of the many well-kept airbases in the South Pacific. Gone are such landmarks as the old Henderson control tower which weathered one Jap raid after another, its flimsy uprights battle-scarred from slugs of flying steel. A stronger, more carefully built structure has since taken its place, but the old tower might well have been called the cornerstone of Henderson Field. Its story is essentially the story of the tower operators who served during those early days. They were boys who had become men overnight—men of the Army Airways Communications System -- and their story might be termed the jive translation of that official phrase, "The former enemy airfield is now in operation." This is their story.—THE EDITOR.*

THE quick black of the tropic night settled down among the palm groves of Guadalcanal and a great yellow bomber's moon rose out of the quiet sea, pouring its amber light along the runway of Henderson Field, down through the tops of the swaying palms, stealing up the crude, angular lines of the control tower.

Two young men, their figures vague and shadowy in the odd half-light, leaned

**The early days on Guadalcanal were like this for the men of the Army Airways Communications System.**

over the railing which enclosed the platform of the tower and peered down from their perch, now into the dispersal areas, now over the runway, now out to sea. A field telephone jangled harshly. One of the men reached out, automatically, without turning his head, and took the telephone.

"Henderson Tower."

A thin metallic warning crackled through the instrument.

"Bogies coming. Direction southeast. Stand by for Condition Red."

"Roger."

The tower operator who put down the phone was tall and stripped to the waist, and a blond fuzz struggled to form a beard on his face. He turned to his companion, and, as though picking up an interrupted conversation, said:

"All right, Dog Face, you can quit pining for Lamour. Tojo's little boys are coming over to play. On with the receiver, and let's keep posted on the slant-eyed spooks."

The other operator, small and dark, reached for his headset. A loud speaker sputtered and through it came a distinct monotone:

"One Victor Two Three calling Henderson Field."

"Sold American!" the blond boy sang out as he grabbed a mike and flipped a switch. He went on in a monotone, "Henderson to One Victor Two Three. Go ahead."

"Search flight coming to you two minutes out. Request landing instructions, please."

"Come in and circle the field. You may have to go out again; Charlie is headed down the slot. Stand by and we'll give you the dope."

"Roger."

He put the mike aside. The other boy turned to him and said, "These binocs don't help worth a damn in this light. Can't see a sign of the bogies yet."

"Can't see 'em?" shouted the blond one, snatching the binoculars from his companion's hand. "F'crissakes, who ya think you are, Superman? You couldn't see 'em in this light if they were right overhead. What's the matter with you, buckin' for Section Eight?"

"It's the sweatin' them out gives me the jitters, I guess," the dark one said quietly. "Just plain scares the hell out of me."

"You and me both. Those bombs whistlin' and crashin' around don't make like lullabies, son. A guy who says he doesn't get the shakes is a Grade-A snow artist."

The other laughed. "If every one of these raids takes a year off your life.



brother, have a look at the walkin' dead."

"Yeah, those fox-hole prayers of ours must be payin' off. Otherwise we'd be S.O.L."

The loud speaker broke in, blaring, "Bogies closing in fast from southeast. Two flights of three medium bombers each. Condition is red."

The blond, fuzzy-faced kid became all business. "Give 'em those lights," he said, jerking his head toward the field. "Hit the foxhole and leave the door open. I'll bring in this rubberneck flight and do a power dive right after you."

His companion looked at him, not moving. "Relax, junior," he said, "Let's both bring 'em in."

"OK, but you don't have to stay here on Condition Red, you know."

"Save it. Here go the lights."

The signal flare lifted and faded in the pale night, and with it came a raucous cacophony of old auto horns, gongs, clanging brake drums, and harsh voices. Over in the tent area, the lights went out as if turned off by a single switch.

Now the moon had the field to herself. The incoming search flight was overhead, its planes circling the landing strip.

On the ground, planes began warming up for the scheduled interception, their slipstreams churning great clouds of dust.

**By** now the Bogies were overdue.

In the tower, five speakers blared at top volume. The blond boy, his fingers clicking at switches, carried on a half dozen conversations, while his companion, pointing a directional-beam gun into the sky, signalled with green flashes to the planes coming in from the search flight.

From one speaker, "Bogies now orbiting. Direction south southeast."

Suddenly, the noise quieted down in the tower, and then from below, new noises were added to the roaring of the planes—noises from the tent area where the men were shouting, gibing, catcalling and whistling, like kids in a neighborhood movie on Saturday afternoon. Something like the kids, the men in the tent area were catcalling partly at the Japs, partly because their own movie had been called off for the raid.

The two tower operators were tense. The blond fingered the controls of the speakers, and the other played with the signal light. From time to time they grinned uneasily.

"You know," said the dark one, "This place really does have the old South Seas romantic atmosphere. At least in the moonlight it does. What a night to pitch a bit of woo . . . Anything new on the Bogies?"

"Nope. That flight of bombers we sent out early this evening is due back pretty soon or we could watch the little son-of-heaven's fireworks from the dugout."

"Yeah, from our nice, comfy little foxhole. Cozy like a sewer."

"Sewer? I've seen you whip in there, son, like it was Shangri-la. Oh, oh, there goes the searchlight over behind the mountain battery. Hear any motors?"

Soon they both could hear a peculiar, desynchronized motor sound—"Washing-machine Charlie." Then, as the noise seemed to be coming from directly overhead, six searchlights stabbed into the sky and converged on one plane high above.

"Let's see what the anti-aircraft boys can do tonight," said the blond, looking up at the plane. "Last time they had Charlie hitch-hiking to hell in nothing flat. Oh, oh. Sticks away! Hit the deck!"

As they dropped flat they could hear the shrieking whistle of the bombs, then a thudding roar as one struck, and boom, boom, as others hit. The bombs whistled and blasted, and each brief pause between sticks was filled in with echoes reverberating far out over the jungle.

The blond boy raised his head. "You know what they remind me of? A big Douglas fir being felled. You hear that wind-splitting whish speed up as the branches whip through the air, and then—boom! She hits the ground. Timber-r-r-r!"

With a ba-loom that the men could feel press against them, a big one struck nearby. The tower seemed to lift, then it dropped and swayed and trembled. "Boy! That was close," said the blond, "but you see what I mean."

"Fir trees, he says. Those damned things sound to me just like a fast freight high-balling over a crossing back home in Kansas. Listen and you'll get it—that kind of trembling roar."

Another bomb hit close by.

"Bing, bam! Thank you, ma'am! That

last baby jarred my bridgework. You OK?"

"Roger. Let's take a look and see if he's using his good eye tonight."

They got up and looked from the platform over the moonlit field. "Set 'em up in the other alley," said one. "He didn't even hit the hospital area this time."

"Every time we get a bombing, I hope he lays an egg near our tent. We'd sure get a swell start on a new foxhole. Save us a lot of digging."

"Boy-oy, the ack-ack boys are hotter than a two-buck pistol tonight. Look at them bounce Charlie around. See him slip that one. Bet he got a fanny full on that burst."

"You ain't beating ya gums, son. One more Charlie will miss some Geisha necking. If that hit's confirmed, it costs me just five bucks even. I bet that noisy AA corporal a fin that they wouldn't get a hit the next time they had a target. I won't even get to help drink up the fin. We won't get any beer around this place unless we make it."

A faint, imperative voice from a loud-speaker broke into their talk. "One Victor Four Three calling Henderson Tower. One Victor Four Three calling Henderson Tower. Go ahead, Henderson."

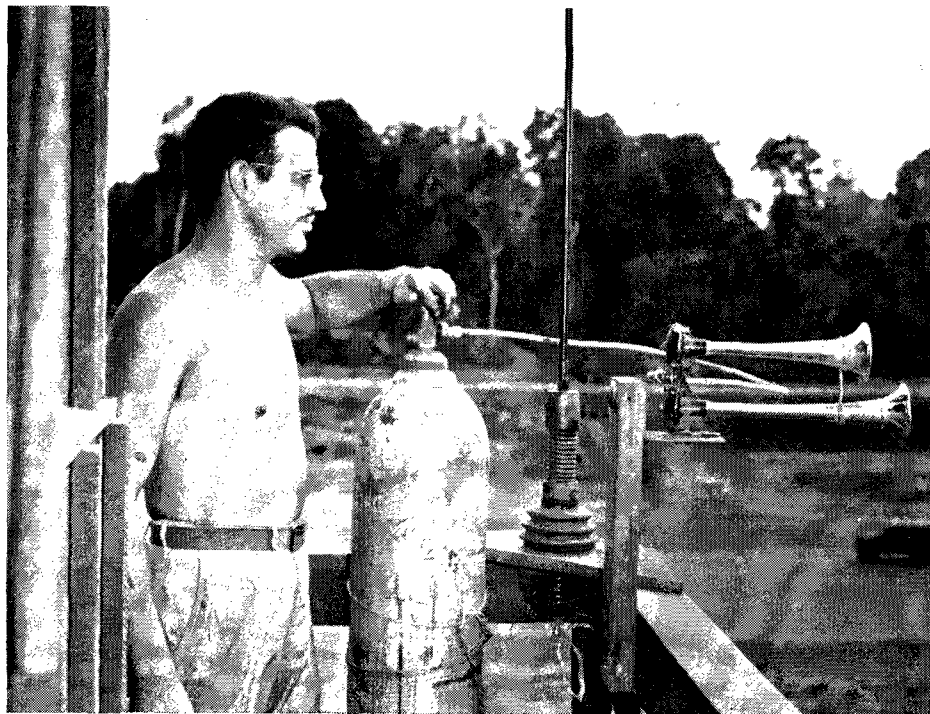
"Henderson calling One Victor Four Three. Henderson calling One Victor Four Three. You are S5, R5. Go ahead."

The light-haired kid listened awhile, and turned.

"Hey, quick, junior, alert the crash crew! Tell them to stand by for a crash landing on the strip. Get an ambulance there. Two unidentified planes, too, huh? A couple of Charlies pulling a sneak!"

The other operator dove to a phone.

This field siren was made from horns stripped off an abandoned Jap automobile.



while his companion went on talking with the men in the air.

"How much gas does your lowest plane have left?"

"Plenty. A couple of hours. How about landing instructions?"

"Hold everything. Circle the field until we identify the strangers. A P-38's going upstairs right now to look 'em over. Calling Four Victor Six Six. Calling Four Victor Six Six. Take off when ready, from the mountains to the sea."

From the P-38, "Roger, thank you."

The 38 roared down the strip, lifted and then zoomed upward, climbing almost vertically. The two men could see the strange planes, and the P-38, hanging on its props, rising toward them high in the moonlit sky. The boys listened to the pilot over the loudspeaker: "Four Victor Six Six calling Henderson. Two medium Jap bombers. And I'm right behind them, closing in now. Here we go. Tally ho."

Other planes in the air came in over the loudspeaker. "Take 'em apart, boy! Teach the little bastards to sneak in without a ticket!"

Other messages were received and the blond boy, answering one, said "Plane with wounded, land on the strip. Mountains to the sea."

"Roger; wilco."

"Which one is it this time, Gracie Allen again?"

"Nope, Butterfingers this time. She's got no more landing gear than a bathtub."

Another plane cut in over the speaker, "Tell him to stick his feet out the bomb bay and run like hell."

"Crash on the strip from the mountains to the sea. Good luck to you."

"Hate to do this. Butterfingers is gonna rip her Sunday panties. Embarrass the lady. Well, here we come."

Another speaker blared: "Six Peter One Two calling Henderson Tower."

"Henderson calling Six Peter One Two. Go ahead."

"Military transport coming in with general officers aboard. Request immediate landing instructions."

"CAN y'beat that," the operator muttered, after flipping the turn-off switch on the microphone. "Those office boys bothering us at a time like this!"

He switched back in. "Sheer off and backtrack on your course a few minutes. Then come in again for instructions. Combat traffic over field."

"Roger," came the meek reply.

Both men leaned over the railing of the control tower and watched as the plane with the wounded hit the mat. As it touched the ground with the dirt spraying up alongside it like water around a speedboat, the ambulance, crash trucks and jeeps roared across the runways. The propellers splintered into the air. The battered plane finally scraped to a halt,



AACS shower at Henderson. Re-fueling pump produces 30 lbs. water pressure in the airtight drums.

and before the emergency vehicles could reach it the crew members piled out.

"Guess this baby won't be a blazer, thank God! Call the strip and see what the score is."

The dark-haired operator plugged in on the command post party line, waited, then broke in: "What's the tale on those last two landings? Yeah? Swell! Nobody seriously wounded? We saw all the crew walk away from the crash. To hell with the plane—the men are safe."

Another interruption: "Six Peter One Two calling Henderson Tower. On my way back to you. Have you landing instructions for us?"

"Come in and circle the field, but don't land until you get the green light." The boy at the transmitter turned to the other: "Guess we'd better get the rest of the technical unit in first. Let the brass hats wait."

"OK, I'll green light 'em. The strip is clear now. Tell 'em to land there." He took up the signal gun, pointed it at the leading plane of the flight coming in and flashed the green landing beam. The planes came in, almost nose to rudder, swung into the taxi strip and parked in their area.

The blond young man was still complaining about the generals. "Now we can green light the big shots. With this important stuff out of the way we can roll out the red carpet for 'em, too. Too bad we don't have an eighty-piece band." He told the transport to follow the bombers in.

"Wonder how the Lightning is doing with the gate-crashing Charlies?"

"Don't worry about that baby. Those P-38s are bad news to anyone who has the bad luck to tangle with 'em. He'll make a good Jap out of a live Jap, wait and see. I'll call the message center and find out what they've heard."

On the phone, "Hello, Harry, any message from that 38?"

"On his way in. Just talked to the AA command post and they say one of the Bogies is down in the drink. The 38 got him in two bursts. No enemy craft now, so we're waiting for 'em to declare Condition Green. Wait up! Here it comes. OK. Condition Green!"

"Thanks, boy," and the young man on the tower hung up, turned to his friend, and said, "Time for lights, bub. All clear."

He recharged his signal pistols, and, brandishing them like a cowboy star riding into town, he shot them into the air. This time the flares were green, and they were faint in the white moonlight. Lights began to wink all over the area.

In the tower the tension was over.

"How about a coke, junior. A nice, ice-cold coke?"

"D'ya feel all right, Daddy? I'd even settle for a warm coke!"

"You'll settle for a chlorine-cocktail and like it."

"Hey," yelled a man from the foot of the tower, "those frag bombs damn near chopped down this thing."

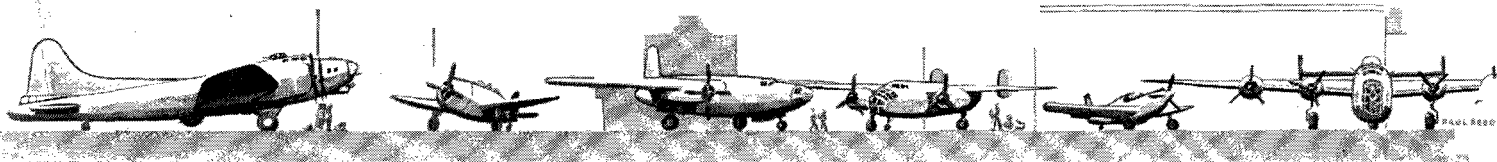
"Not frag bombs. The beavers did it." The dark young man tossed a canteen to his companion. "Here, have some horse medicine." ☆



## WHAT'S WRONG WITH THIS PICTURE?

Clumsy maintenance is apparent in the men swarming around this engine. It is our guess, however, that Cpl. Andrew J. Greska, on the end of the engine mount, is smiling to himself at the snafu poses. Staff Sgt. John J. Bailey, seated on the maintenance stand, also insists that he knows better. For that matter, so do Cpl. Richard L. Satterlee, on the wing, and Pvt. Vern Wickline, top center. Attached to the 88th Depot Repair Squadron at Patterson Field, Ohio, the men got quite a kick out of posing the ON THE LINE boners for December.

Careful maintenance work—knowing the rules and following them—is just about as important as dropping bombs when the airplane is finally ready. In fact, you can't have one without the other. Watch your Ps and Qs ON THE LINE. Better yet, watch the TOs.



## EVERY MECHANIC AN INSPECTOR . . .

Before installing a part on an airplane or engine, examine it closely for possible defects, even though the part bears a serviceable tag. Damage can occur before the part reaches you. It may have been dropped, stepped on, or it may have fallen from the parts truck enroute. What happens if you put your entire trust in the tag and install it?

Not long ago a de-icer fitting was installed on an airplane, and during inspection a tube was found flattened, closed shut and cracked at one end. Fortunately this was discovered before the ship was flight tested. Man hours were wasted, however, removing this part and installing another.

Usually caught by inspectors before the airplane leaves the shops, a defective part in many instances cannot be detected by visual inspection. Only in flight do these defects show up—then it's too late.

Another example: A vacuum pump was installed on an airplane, but the gasket did not have the hole in the proper place to permit oil to circulate from engine to pump. After the installation had been completed, the omission could not be detected by a visual inspection. The airplane was released for flight and after several hours of flying the pump went dry and the vanes froze fast to the body of the pump. Consequently the shaft snapped, causing complete failure of the vacuum system and rendered most of the flight instruments inoperative.

Men, look those parts over before you begin an installation. Examine tubing closely, so that nothing obstructs passage of various fluids. Examine parts which function mechanically for perfect condition. Consider yourself an inspector—you'll save many hours and help to eliminate crashes and forced landings.

## ON SERVICING AIRPLANES . . .

It's time for a discussion of gas servicing practices **ON THE LINE**. Here are a few things to refresh your memory concerning this everyday routine job you mechs perform so often that now and then it is easy to get careless.

Are you connecting the static discharge clip or plug prior to putting the nozzle in the tank as outlined in TOs 12-1-10,

06-5-1 and 12-1-7? Are you making the mistake of dragging the refueling hose across de-icer boots (TO 03-35B-1)? Are you remembering to replace a worn grounding chain to the refueling unit? To insure contact over rough ground AR 850-20 requires four inches of chain to be dragging; check TO 12-1-10 also.

Is the radio or other electrical equipment in operation during refueling or cleaning? TO 01-1-1 states that no smoking, open flame or electrical devices will be permitted or operated at this period.

Are you improperly utilizing the catch on the servicing nozzle to hold the valve open when the tank is nearly full? This practice results in an overflowing tank and creates a fire hazard and a potential danger to personnel due to the gas flying up in the face of the servicing mechs.

Remember that AAF Regulation 85-6 prohibits the parking of refueling units within 100 feet of hangars. Naturally, this also means never park them *inside* the hangar. Airplanes are not to be refueled nor gas drained inside the hangar, according to this regulation.

Additional reminders: It would be well to check and see that gasoline lines and packing joints are being maintained properly. Particularly is trouble encountered in the packing joint where the fuel line enters the hose reel. Concerning this, brush up on TO 19-25 series.

## FILL 'EM UP . . .

Oxygen cylinders now being installed in combat aircraft are non-shatterable and are intended to be filled to at least 400 pounds pressure. Actually, they should be filled to 425 pounds to allow for a slight drop in pressure which occurs when they cool. Refer to TO 03-50-1.

Smooth (unbanded) cylinders, with the exception of type H-1 bail out cylinder and type A-2 portable cylinder, are not shatterproof and should not be filled to more than 300 pounds in combat areas in accordance with TO 03-50-9.

## WATCH THE WELDS . . .

Mechs, you may prevent a fire in the plane you're working on by checking carefully for cracks in sections of fuel lines, fuel vents and drain lines which have been welded. If you find a leak and repair

it before the crack has grown larger and becomes a fire hazard, you have gone a long way toward saving a crew and plane.

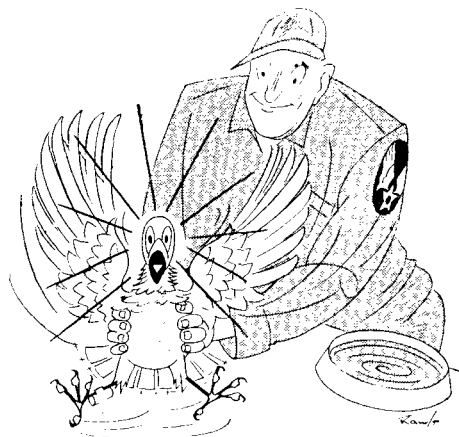
## A GOOD MOTTO . . .

A plane is no better than the mechanic who services it.

## BIRD IN THE HAND . . .

A new TO, "Handling and Releasing Homing Pigeons from Aircraft in Flight," is beamed particularly to flying personnel, but it also has definite interest for ground crewmen as well. If a plane equipped with pigeons runs into trouble, the TO (01-1-120) tells flyers how to get the birds out of the plane safely and with messages properly attached. Pigeons are almost infallible, but they do get thirsty and hungry so one might drop by your hutch looking for a handout.

If you know how to catch him, you may be able to speed the message to proper authority. Water is the best bet since after flight that is the first thing on the pigeon's mind. Food comes second. If these baits fail, shoot him. If you can



get your hands on him alive, do so by grasping the bird over the outer flight (wing) feathers far enough forward so that your thumb and first finger are placed to hold his legs still. Captured that way he'll live to fly again. If shot, consider him as emergency rations.

Every army uses pigeons. If flying purposefully, they are best left alone. If wandering aimlessly, resting or injured, they should be captured. You may intercept vital news from the opposition. ☆



# BLACK LIGHT

By Dr. S. M. Burka

MATERIEL COMMAND

THE mystery which has apparently developed concerning so-called "black light" and the phenomenon of luminescence calls for some clarification.

Electromagnetic waves, like water waves, run the gamut from ripples to ocean rollers. The ripples measure one ten-billionth of an inch from crest to crest, the rollers hundreds of feet.

The shorter of these waves we call X-rays and the longer, radio waves. Out of this tremendous group one tiny octave, sixteen millionths of an inch to thirty millionths of an inch, from crest to crest, affects the eye as light. The shortest visible waves produce the sensation of violet and longer ones, in order, blue, then green, yellow, orange and red.

The combination of all the visible waves produces the sensation we call white. We see objects, except self-luminous ones, by the light reflected from them, and their colors are determined by the wave lengths they reflect. If they reflect all wave lengths they will appear white when illuminated by white light, and black if they reflect none. A white object therefore will appear green if illuminated by green light and red if a red light is employed. A green object appears green to white light because it reflects only green light and not blue or red, and it will appear green if green light falls on it. If red light is used to illuminate a green object, it will appear black because the object does not reflect red light.

Waves too long to affect the eye are called infra-red, while those too short to affect the eye are called ultra-violet. Because ultra-violet waves behave like ordinary light, but cannot be seen, they have been given the popular name of black light.

The reaction of certain substances to ultra-violet rays forms the basis of AAF cockpit lighting systems. Such substances absorb the ultra-violet which falls on them and re-emit the absorbed energy as light of longer wave length. Since wave lengths longer than that of ultra-violet affect the eye, they are visible and we have the remarkable effect of seeing objects illuminated by invisible light.

This property, commonly called fluorescence, is present to some degree in a large number of substances. Varnish, paper, the skin, finger nails, the teeth (except false teeth) and the lens of the eye, all glow when "lighted" by ultra-violet light. But in addition to these, many dyes and minerals fluoresce very strongly. These materials are called "luminescent." *Luminous* materials are those which generate their own light energy, while the *luminescent* ones require activation by external energy sources.

Luminescent materials are divided into two classes. Those which cease emitting light when the activation stops are called fluorescent. They black out as soon as the ultra-violet lamp is turned off. Materials of the second class, called phosphorescent, store up energy and continue to emit light for a limited time after the activation ceases. Some phosphorescent compounds continue to glow for six or eight hours after external activation has ceased.

Although fluorescent light emitted is always of longer wave length than that of the exciting radiation, it bears no relation to the color of the materials as seen in daylight. As a consequence, we have pigments, white or yellow in daylight, which shine with blue, green, yellow or red light under the ultra-violet lamp.

Radium salts also cause fluorescence so that if traces of radium should be incorporated in the pigment, the glow will continue indefinitely. Under the ultra-violet lamp this type of pigment shines brightly, but when the lamp is turned off the glow decreases immediately if fluorescent, or slowly if phosphorescent, until the level determined by the amount of radium is reached. This level of brightness is then maintained indefinitely, and the material never completely blacks out.

The system of ultra-violet lighting permits extreme flexibility and control of cockpit lighting. The cockpit can be flooded with black light yet nothing will

be visible except those parts deliberately intended to be seen. The lamp itself, the panels, the instrument faces, labels, knobs and brackets all remain invisible. Only the dial graduations, the instrument pointers, essential labels or other parts marked with luminescent pigments appear—in any color desired, regardless of their daylight color.

If fluorescent materials are used, perfect control over the brightness can be exercised. When the lamp is turned down the brightness of the markings decreases, and when the lamp is turned off the markings disappear instantly. If some critical markings must be visible at all times, radium is added to the pigment used and, when the lamp is turned off, these particular markings will drop to the low light level desired, remaining at that level indefinitely.

At present, AAF cockpit instruments are marked with a green luminescent-phosphorescent material because, at the time ultra-violet lighting was adopted, this was the only stable material available. Since the material is phosphorescent it does not respond immediately to changes in intensity of the lamp but lags several minutes behind. Then, if the lamp is extinguished, it will continue to glow for an hour or more. This glow is *not* due to radium content. In fact, only about six of the instrument types have any radium and this small amount is on only a few critical graduations of the basic flight instruments. To perceive any difference, it is necessary to keep the instrument in total darkness for an hour or more. By this time the phosphorescence will have died out and the radium activated marks will be the only ones remaining visible. The radium brightness is at a very low level and it is necessary for the observer to keep his eyes in darkness for at least a quarter of an hour before he can see the markings.

It has long been known that if the eyes are kept in darkness for a half hour or more they become enormously sensitive to faint light. This process is known as dark adaptation. If one looks at a bright light after dark adaptation the dark sensitivity will be lost and another period of darkness will be required to restore it. Naturally the brighter the light the more complete will be the loss of dark adaptation, but a very interesting fact has been noted in this connection: The shorter visible wave lengths are more effective in this spoilage than the longer ones. A blue light will ruin this dark adaptation as quickly as a white light of the same brightness, but a deep red light will have considerably less effect. A red flashlight or red floodlight bright enough to permit reading may be used safely without serious effect on dark-adapted eyes, whereas a white, blue or green light of the same brightness may com-

**An explanation of luminescence and how it is being used for night-lighting cockpit instrument panels.**

pletely nullify the sensitivity acquired in the adaptation period.

Since the dark-adapted eye is extremely sensitive, a four watt bulb will provide ample illumination. The bulb, which emits visible as well as ultra-violet light, is enclosed in a housing with a glass window designed to filter out all visible light while permitting passage of ultra-violet rays. Actually this glass transmits a little blue and a little red so that a faint purple light is seen if one looks directly into the lamp. At the same time a white fog appears due to the fact that the eye itself fluoresces and the interior of the eye therefore lights up. This fog decreases the ability of the eye to see outside objects so care must be taken in placing the light mounting to prevent any direct ultra-violet light from falling on the eyes.

Now that stable fluorescent materials have been developed, advantage will be taken of these facts in modifying cockpit lighting systems. Since we desire complete control of brightness, luminescent-fluorescent materials are to be used. Then if the lamp is dimmed the dials will dim correspondingly. When the lamp

### In Summary

**Black Light**—the invisible rays that light up instrument dials in a cockpit—is one of the common phenomena of electromagnetic waves that is difficult to understand principally because it cannot be seen.

Its use in airplanes is essential to protect the night vision of pilots and to keep the cockpit dark, thereby preventing disclosure of the plane's presence and position to enemy aircraft.

Present instrument dials emit a pale greenish light reflection which continues to glow after all light sources have been eliminated. Discovery of a new stable luminescent material that is fluorescent but not phosphorescent now enables instantaneous blackout of all dials. This material, developed to emit an orange reflection as further protection for the pilot's night vision, is being applied to all new instruments as rapidly as manufacturers can change over.

is turned off the cockpit blacks out instantly. Except for night fighters, a few essential flight instruments will have markings in radium-activated fluorescent material. These marks will continue to glow at a very low level, but which will be readily visible to the dark-adapted eye.

Since either red or ultra-violet illumination is to be used (red because it does not spoil the dark adaptation), the reflection color (i.e., color to daylight) will be nearly white. In order to preserve further the dark adaptation, the fluorescent color is to be orange instead of the present green.

The number of graduation markings will be decreased to the minimum necessary, but additional graduations to those necessary for flight will be required for purposes of calibration, testing and the like. Their markings will be in a green non-luminescent material. The non-luminescent material is invisible under ultra-violet light and being green will be invisible also under red flood lighting.

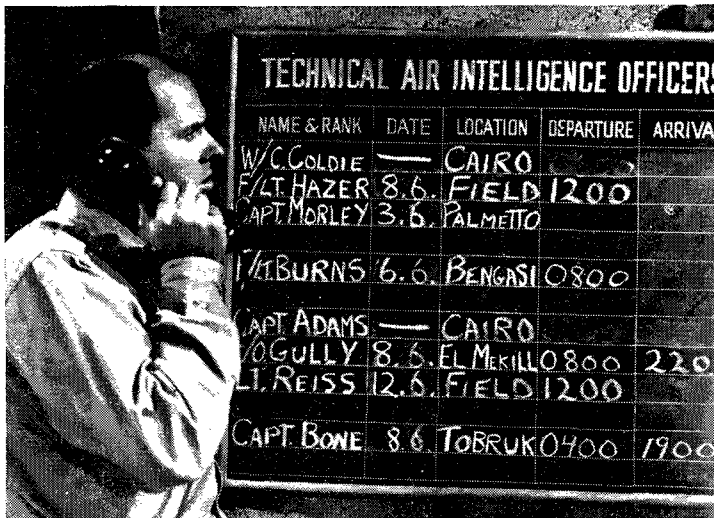
The new dials therefore will show only the minimum markings when used at night, but by daylight will give all the data required. ☆



# TECHNICAL



1—The scene opens with a group of intelligence officers discussing the ME-110 and expressing the desirability of gaining access to one of the planes reasonably intact to determine its operational characteristics.



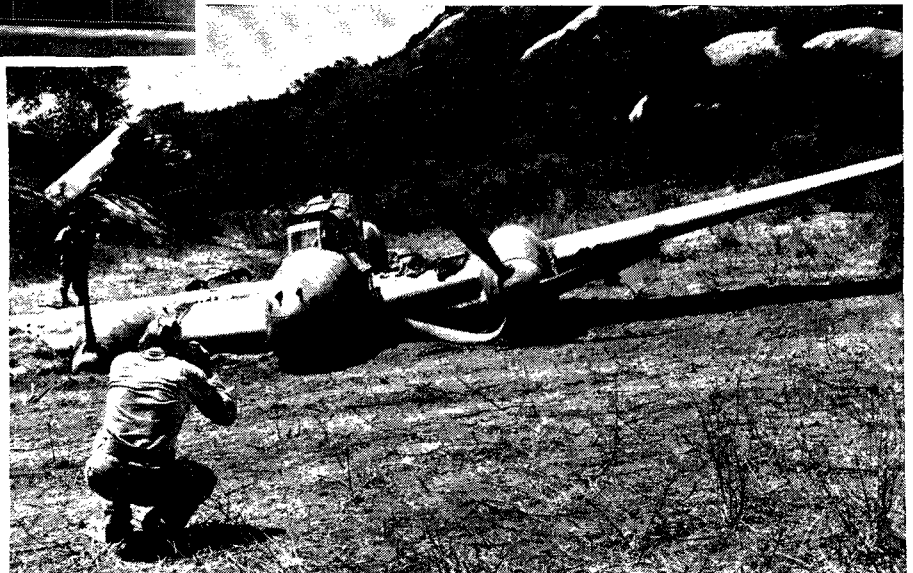
4—On reaching the plane, Morley jots down notes as he talks with Lieutenant Haines, in charge of the guard placed over the wrecked fighter.



3—A-2 checks the assignment board and puts a crash-officer, Captain Morley, on the inquiry. Captain Morley departs immediately for the crash scene.

2—Meanwhile, in the African theatre, a P-40 pilot reports that he has shot down an ME-110 and that the plane appears to be salvageable. The intelligence officer calls Base A-2.

5—After a preliminary examination of the wreck, Captain Morley snaps photos of the plane from all angles for the intelligence records.



# INTELLIGENCE



6—Captain Morley's problem is to discover why the plane went down. He examines the instruments and finds them in proper working order.



7—He then discovers that someone has removed a name plate. When the lieutenant asks why it is so important, Captain Morley explains that every part has a story to tell and so is of value. Lieutenant Haines hands over the name plate which he had taken as a souvenir.

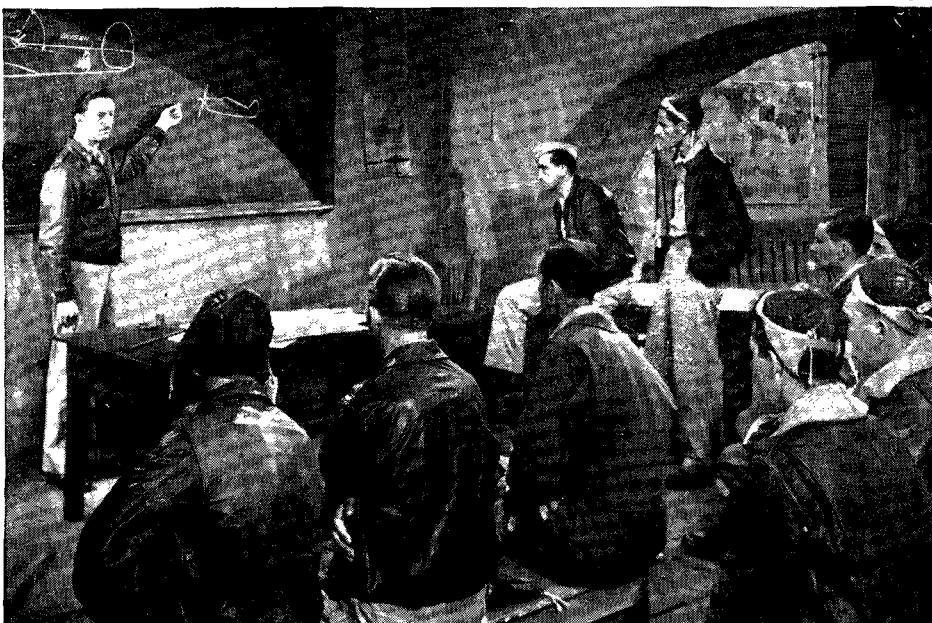


8—Captain Morley sees a guard flicking ashes into a rounded fragment of metal. Other similar fragments were picked up, and it is found that the explosion of oxygen equipment caused the fighter to crash.



9—The conclusions were verified at Materiel Command headquarters, Wright Field, where the plane later was taken for further study.

**AAF FIRST MOTION PICTURE UNIT**  
Culver City, California



10—The scene shifts back to North Africa where a squadron commander applies the lessons learned in the investigation and instructs his pilots in methods of attacking the ME-110 as a result of the findings.

### WHAT THEY'RE READING

**A** COMPREHENSIVE manual, "The Air Force in Theatres of Operations—Organization and Functions," is being distributed to AAF organizations by the Chief of Management Control, under whose direction it was prepared.

The complete manual consists of 27 chapters, each dealing with some particular phase of Air Force organization or activity. These are combined into six separate booklets which, together, cover the organization, mission and operation

of the Army Air Forces; the mission and organization of fighter, bomber, air support and air service commands; the duties and responsibilities of general and special staff sections, and the duties of squadron officers.

Chapter 27 (Booklet VI) of the manual is being reprinted separately, for squadron distribution. This chapter deals specifically with squadron mission and organization, squadron management and duties of squadron officers.

**YOUR BODY IN FLIGHT.** "Your Body in Flight," prepared by the aero-medical laboratory at Wright Field and published as Technical Order No. 00-25-13, tells in simple cartoons and accompanying text exactly what happens to the human body when flying in an airplane. Every physiological subject is covered, including high altitude, blackout bends, night vision, first aid in the air, and so on. The main purpose of the publication is to enable flyers to understand thoroughly the physiological problems they face on a mission.

**OXYGEN EQUIPMENT.** Revised Technical Order No. 03-50-1, "Use of Oxygen and Oxygen Equipment," contains comprehensive instructions and many new items which should prove valuable to high-altitude airmen.

**RECOGNITION.** To aid in recognition of planes, ships and tanks, the Army and Navy are publishing a new monthly magazine, "U. S. Army-Navy Journal of Recognition." Widely distributed throughout the AAF, it supplements other recognition material.

In addition to publishing latest recog-

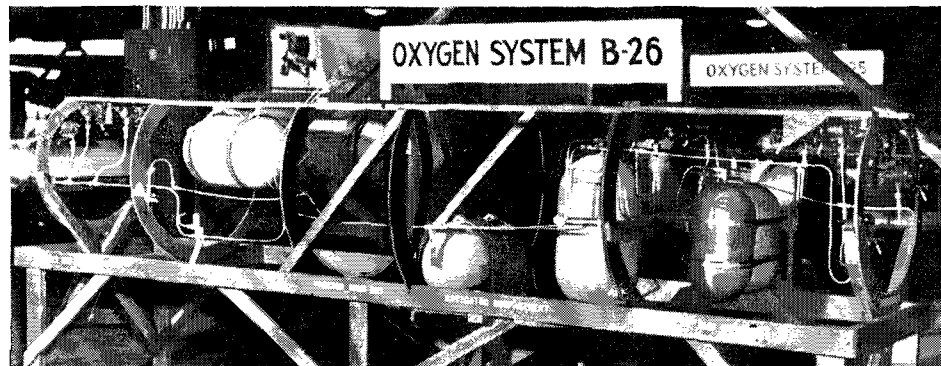
nition developments, the magazine contains changes in equipment and methods, both our own and the enemy's.

**NOTES ON AIR GUNNERY AND AIR FIGHTING.** The Training Aids Division has reproduced a booklet entitled "Notes on Air Gunnery and Air Fighting" by Group Captain E. M. Donaldson, one of the RAF's most experienced fighter pilots. Because it summarizes the lessons which he and others have learned from actual combat, it should be helpful to pilots, pilot trainees and instructors.

**INSTRUMENT FLIGHT.** The important subjects of instrument flight and radio navigation are covered in a two-volume publication of the Navy's Bureau of Aeronautics, Training Division. Part I, dealing with Instrument Flight, is a straight Navy publication, enlivened with illustrations by the same artist whose work brightens the pages of the Navy "Sense" publication. Part Two, dealing with Radio Navigation for Pilots, is a special Navy edition of a book of Colin H. McIntosh, assistant superintendent of flying school operations, Military Division, American Airlines.

**OXYGEN SYSTEM MOCKUP.** A schematic model of an aircraft oxygen system (below) is now in use at Sheppard Field, Texas, for the training of maintenance

crews in the proper servicing of oxygen cylinders, regulators, valves, lines and fittings. The device was designed and produced at Sheppard Field.



**AIR POSTERS IN PORTFOLIO.** There is a growing demand in the Army Air Forces for training posters, especially for poster series bound in portfolio form for classroom instruction.

The Training Aids Division has prepared a number of poster series bound in portfolio form. A lightweight binder serves as a container for shipping or carrying and as an easel for classroom use.

The poster illustrations and text matter cover the high points of courses of instruction for which they were designed. Drawings or photographs appear on the face of the sheet and on the back of the preceding sheet appropriate lecture notes are provided for the instructor.

The standard binder is made of die-cut cardboard, covered with olive drab slick paper stock. A handle is provided for the instructor's convenience. Like the poster sheets, the binder comes in two sizes:



Air poster portfolio.

30 by 40 inches and 22 by 32 inches.

The portfolio can be used anywhere—in the classroom, in the field, or under the shade of a tree or airplane wing.

In addition to the development of the poster series, AFTAD is canvassing all poster sources—military and commercial—to compile a catalog of training material which is available for distribution to AAF training activities.

Manufacturers of AAF equipment are cooperating with the training program by preparing and issuing air posters suitable for classroom use. Before the posters are issued, they are submitted to AFTAD for approval and for a determination of the requirements of AAF training stations. ☆

#### WHERE TO GO

Information on the availability of training films and film strips, aircraft recognition materials, synthetic training devices and training literature may be obtained from the Training Aids Division, Army Air Forces, Park Avenue and 32nd Street, New York, N. Y.





## ...BEEN HITTING THE BOTTLE?

No, worse luck, he hasn't! (Meaning the oxygen bottle, of course.)

If he had, he wouldn't be cutting up and behaving like a rummy at 15,000 feet. His is a beautiful case of anoxia (lack of oxygen) and it's playing hell with his sense of proportion—all because he is a wise guy and won't use his oxygen.

He has false feeling of exhilaration and self-confidence (one of the usual anoxia symptoms).

He thinks he's OK. But that's how anoxia works. You begin losing efficiency

at 10,000 feet; as you go higher your physical and mental functions become more impaired, and sooner or later you pass out completely.

So instead of getting ossified in the rarefied, be sure your oxygen equipment is functioning properly—and USE it above 10,000 feet. This will guarantee the clear head and steady hand necessary to shoot down the Nazi in the manner to which we would have him become accustomed.

(Fourth in a series by the Office of Flying Safety, formerly the Flight Control Command.)

# TECHNIQUE

A Review of Technical Developments in the Army Air Forces

**E**FFICIENT as they are, modern aircraft engines cannot digest sand.

The Germans found that out in Africa. So did the British and Americans. In fact, both sides discovered that it was possible for a new engine, ordinarily good for thousands of hours, to pick up so much sand on a single flight that piston ring wear would exhaust the oil supply and the plane would have to be abandoned behind enemy lines.

In this country, dust arising from training fields newly plowed out of the plains of the southwest has likewise emphasized the need for adequate air filter protection.

Air filters for aircraft engines were designed over twenty years ago, but the type of flying in the years of peace was such that engine wear from dust was not a particularly serious problem. Planes for the most part operated from airports with paved runways and sodded fields, while even on maneuvers the dust from temporary airfields did not affect a sufficiently large volume of planes to warrant installation changes.

In operations today, however, air filters are a necessity. Without adequate air filter protection, excessive engine wear makes it necessary to overhaul and rebuild engines at frequent intervals, increasing the use of maintenance workers and spare parts in areas where both are likely to be scarce. Even more important is the production problem, for an engine saved for further flight is the equivalent of an extra engine produced on an assembly line.

A great deal of research and experiment has been conducted on air filters in the last twenty years, particularly on air-conditioning equipment for offices, stores, theaters and factories. Filters also have been designed for farm equipment—a "must" out in the dust bowl regions—and for large stationary engines. Three general types are in use, although there are many others in existence, and one of these three has been found adaptable for use in aircraft engines.

One type is the oil bath filter, in which the intake air stream is directed against a tank of oil at the bottom of a U-shaped passage. The air stream bounces off the surface of the oil, while the dust and sand is retained. Although efficient, this type of filter cannot be used in aircraft, for the first bank or any other change of position from horizontal flight would cause the oil to spill over and slosh through the intake passage. In addition, this type of filter is extremely heavy for aircraft use.

A second variation is the dry-type filter, quite frequently used in air-conditioning systems, where size is not an acute problem and where air velocity is low. Felt, fabric or heavy layers of mesh or gauze are used as the filter media. These filter materials offer high resistance to the airflow and the resistance increases as dust is accumulated on the material. In

addition, they are inflammable and require frequent replacement. They have a further disadvantage for aircraft use in that if they become damp, through storage in a damp place, or if they become wet during flight through a rain storm, the clay in the dust forms a mud pack over the filter, severely restricting the flow of air.

The third type of filter, the one now in most common use on American aircraft, utilizes a viscous impingement filter element. Briefly, these filters consist of knit wire or knit metal ribbon sheets suitably crimped and packed into durable metal frames. The mesh of the sheets is varied, becoming progressively smaller from the front, or intake, side of the filter to the rear side. The layers are supported in the frame with sufficient structural strength to withstand engine backfire pressure without damage.

Before use, the filter is dipped in engine lubricating oil and allowed to drain before it is installed in the induction system. The mesh of the dural sheets mechanically separates the particles of dust from the air stream and then the oil entraps and holds the particles. The filter element is installed in such a manner that it can be easily removed. Then it is cleaned in gasoline, dipped in oil and is ready for service again.

Viscous impingement filters, when properly made, are capable of removing a minimum of ninety percent of the sand from the air when the air velocity is 1,000 fpm without imposing a pressure drop of more than four inches of water. Filters having this performance can be built in a wide variety of shapes to fit the installation requirements, although flat surfaces are more easily manufactured. The thickness of the element is usually two inches.

No attempt has been made to standardize the dimensions of a filter element because the configuration of air scoops varies with the design of the airplane, and therefore the shape of the filter has been left flexible so that installation designers will have as much leeway as possible.

Even though the design treatment of an induction system varies widely from one airplane to another, certain parts are common to them all, as shown diagrammatically in Figure 1.

There are several ways in which the conventional induction system can be altered to accommodate a filter element. Figure 2 illustrates diagrammatically one way in which a conventional induction system can be changed to accommodate an air filter.

Note first that the filter is disposed so that it can be easily removed for cleaning. Ease of servicing is of great importance. It is usually necessary to position the filter at an angle to get an element of sufficient area into the scoop.

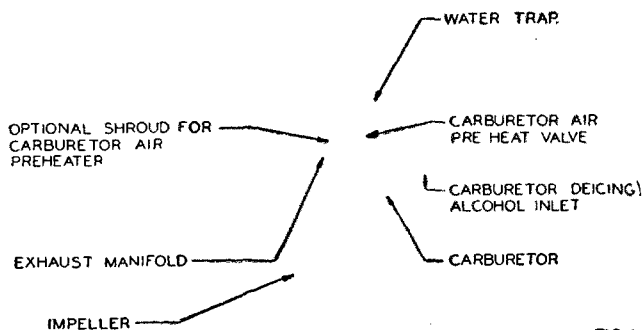
Just ahead of the filter element are ejection slots which bleed off some air which carries away the dirt and free water

## Operation of Air Filters

By Wayne D. Cannon

WRIGHT AERONAUTICAL CORP.

**TYPICAL NON FILTERING INDUCTION SYSTEM**



**FIG. 1**

that settles in the airscope or is deflected by the filter element. These slots should be located with respect to pressures inside and outside the scoop so that the airflow will always be in the proper direction.

These slots replace the water trap shown on the previous system, since it is of utmost importance that the induction system be thoroughly sealed to prevent sand by-passing the filter, as would be the case if the water trap were not omitted.

In this connection, it can be pointed out that seals are shown around the filter element, at all joints, and at the alternate air intake.

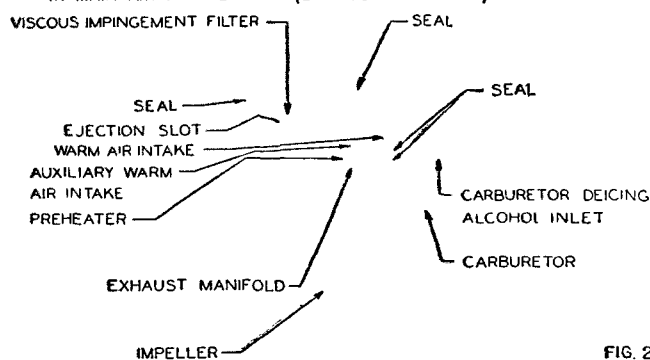
The rest of the system is the same as a non-filtering installation with one exception. That is the treatment of the alternate air intake and carburetor air preheater.

In Figure 2 the solid lines represent the alternate air intake which takes warm air from the rear of the engine. The dotted lines indicate a shrouded exhaust manifold which picks up and preheats the carburetor air before it enters the induction system. This system may produce very high carburetor air temperatures if there is not an admixture of cold air through the main air intake. For this reason another valve can be added, which will be referred to as the auxiliary warm-air valve. This valve can be rigged to a single preheat control in the cockpit, so that for the first portion of the cockpit control travel the auxiliary warm-air valve remains fully open and does not start to close until the admission valve in the air-scoop is fully open. As the cockpit control is moved further toward the full-hot position, the auxiliary warm-air valve closes to give the pilot full use of the preheater.

This method of operating the preheat system adds no duties to the pilot and yet gives him an induction system suitable for flying in all kinds of weather.

This additional warm-air valve may appear to be an unnecessary refinement. It has been used on commercial airplanes for many years and is only new in its application to a filter installation. It is important, however, since it is conceivable

**TYPICAL INDUCTION SYSTEM WITH VISCOUS IMPINGEMENT FILTER IN MAIN AIR INTAKE (EXHAUST MANIFOLD)**



**FIG. 2**

that a ship with a filter installed in the airscope may climb through a snow storm and have the filter completely blanked off and come out into sub-freezing temperatures that will not clear the filter. If, under these conditions, full power was required, the engine could best be served if the carburetor air temperatures could be held within reasonable limits. This auxiliary warm-air valve in the preheat system takes care of such an emergency.

The entire alternate air intake system is used only in emergencies, and it has been found that sand is usually not present in damaging quantities in atmospheric conditions that require the use of the alternate air intake.

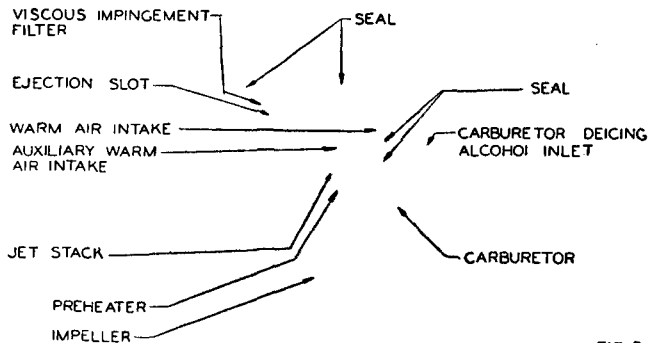
Figure 3 is similar to Figure 2, except that it illustrates a jet-stack installation in place of a manifold type of exhaust system.

Figure 4 illustrates one type of filter installation in an induction system employing a turbo supercharger. Note that the filter is located on the pressure side of the turbo compressor after the intercoolers. This location was selected as the point that will produce the least effect on the performance of the supercharger. The filter is located after the intercoolers for two reasons: first, so that heat control can be accomplished with the intercooler shutters and, secondly, so that the normal flow of air through the viscous impingement element will be at a reasonable temperature.

In a turbo installation there is some advantage at high altitude in being able to stop bleeding air out of the induction system on the pressure side of the turbo supercharger, and for this reason the diagram indicates controllable flaps at the ejection slots.

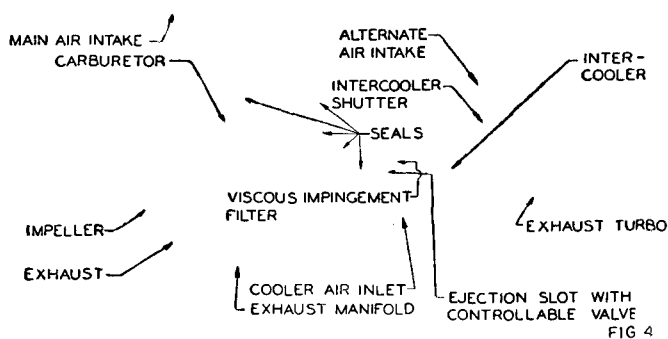
The diagrammatic installations shown are believed to give the engine the protection it needs against damage by sand, with the least complication and least added weight to the airplane, without upsetting the carburetor metering, and without imposing any responsibility or added duties on the pilot or flight engineer.

**TYPICAL INDUCTION SYSTEM WITH VISCOUS IMPINGEMENT FILTER IN MAIN AIR INTAKE (JET STACKS)**



**FIG. 3**

**TYPICAL INDUCTION SYSTEM WITH EXHAUST TURBO SUPERCHARGER AND VISCOUS IMPINGEMENT FILTER**



**FIG. 4**

## Production Line Maintenance

One completely rebuilt aircraft engine every 45 minutes is the pace being set by ASC's model depot at Tinker Field, Oklahoma City.

Although not a manufacturer, this depot has perfected a system of production line maintenance that resembles those of pre-war automobile plants. Other ASC depots are adopting similar systems in their intensive drive to keep all our planes flying. Perfection of course is impossible but the OCAD, commanded by Brig. Gen. Arthur W. Vanaman, has reduced the number of grounded planes to less than ten percent of the thousands in its extensive service area and has the best record among ASC depots.

One of the chief reasons for this record is the rapid engine overhaul system being carried out under Col. Leslie G. Mulzer, veteran command pilot and chief of the engineering department.

The scarcity of trained mechanics was the original stumbling block in expediting the overhaul of intricate aircraft engines. The problem was solved by instituting training programs on specialized jobs in which individuals are instructed in one or two essential operations such as tightening bolts or inserting rods. After a trainee has acquired speed and skill, he is assigned to the assembly line where he performs continually this one specialized operation.

The assembly line system of overhauling and repairing aircraft equipment was not applied fully to air force installations until the shortage of skilled mechs made it impossible for crews to overhaul complete engines themselves. Now the engine shell moves through the line in eight hours.

Within this time the engine is removed from a plane and delivered to the engine repair section's dismantling department. Utilizing the scientific "magnaflux" X-ray process of analyzing wear, fatigue, breaks or irregularities in every piece of metal, each part of the engine is tested, inspected and if found in proper condition, forwarded to the "parts pool." Imperfect parts are either salvaged or reconditioned and returned to the pool, the depository for all engine parts except closely integrated units such as gear trains and fitted units which are tagged together.

Because tolerances are so close and inspections so thorough, every part is interchangeable. When an engine is rebuilt it may contain parts from as many as thirty different engines yet operate as efficiently as a new one.

Along the re-assembly line are work benches with small stocks of parts for each station's operation. Above each bench is a red light that is flashed on when the supply of parts at that station is running low. A stock tracer immediately checks the station number and draws from the parts pool to replenish

the supply at that bench, keeping the line flowing.

When completely reassembled, the engine is put through a test run under simulated temperature extremes. If found satisfactory, it is then released for installation.

New tools and new methods are constantly being adopted to expedite the process and assure uniformity. These include a special nut tightener operated on the electric drill principle, with

special adjustments equalizing the tension so all nuts are tightened to the same pressure.

The depot's engineering division also has extended its production line methods to such items as instruments, spark plugs, generators, starters and magnetos, and through its specialized training program has been able to step up its rate of instrument repair and overhaul to about 8,000 per month.

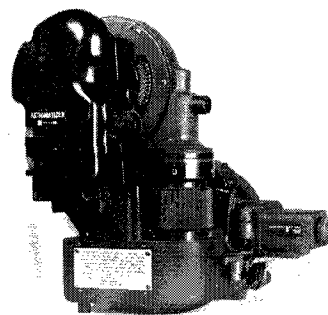
Additional evidence of the success of the system are these monthly output figures: spark plugs, 80,000; magnetos, 1,300; starters, 450, and generators, 300—all completely rebuilt. Many of these units are installed in the more than 100 aircraft which are completely reconditioned each month at OCAD. The remainder are shipped to sub-depots in the service area and to overseas centers. — **Capt. Robert V. Guelich.**

## A New Aid to Navigators

An averaging sextant has been designed to increase accuracy and relieve the navigator of the excessive mental and physical fatigue connected with computing averages arithmetically or with using earlier and simpler types of averagers.

The new instrument is an ordinary AAF type sextant with an automatic averaging device attached. This device is merely a chronometric or clock type instrument which is simple in operation and requires very little effort from the navigator using it. Conservation of effort is very important to naviga-

tors working long flights at high altitudes in more or less uncomfortable surroundings and distractions. Navigators find that they are prone to make many mistakes in the simplest kinds of computations when working under such unfavorable conditions. Only navigators who have had to rely on the older methods of averaging their celestial shots can appreciate the advantages of the chronometric integrator or averager.



New averaging sextant.

It is quite well established that accuracy of celestial observation is greatly increased by this type of device which automatically averages some 100 shots in two minutes of observation, thereby virtually eliminating chance error due to small speed changes, vibration and rough air. The shots are taken at a uniform rate of one every two seconds. Principal factors contributing to better accuracy in celestial observations are:

1. Decrease of fatigue and human error.
2. Ability to average a greater number of shots in one observation.
3. Assurance of uniform spacing of shots.
4. Freedom of the navigator to concentrate on keeping collimation between the bubble horizon and the body being observed.

Operation of the averager is simple and straight-forward. The navigator winds the clock apparatus prior to taking the observation. He then sights the sextant in the usual manner at the celestial body to be observed. When he has the bubble horizon and body in or near coincidence, he flips a lever which locks the averaging device at a zero or reference point. The instrument is now set up for making the observation. When the navigator gets the star and bubble in coincidence, he presses a button which starts the chronometric device averaging plus and minus from the zero or reference point. He now has only to hold the star and bubble in coincidence until the two-minute period is completed at which time a dark shutter obliterates the field of view. The navigator may then read the average altitude of observation direct on a Veeder-type counter on the side of the averager. — **Prepared by the Materiel Command Equipment Laboratory, Wright Field.**



Engines are torn down, get steam bath before "Magnaflux" testing.

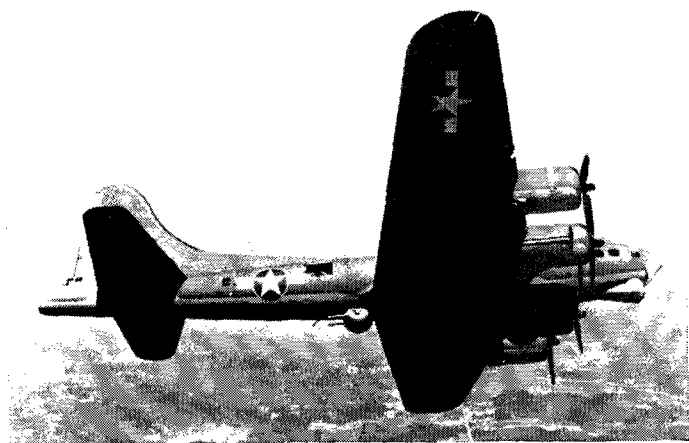
## Introducing the B-17G

The B-17G, incorporating a number of new features, is now in production.

The most noticeable change in the Fortress' external appearance is the addition of a chin turret. A twin .50 caliber unit, the turret is located directly under the bombardier's compartment. It is electric-powered and the two M-2 machine guns are equipped with recoil absorbing mechanism, firing solenoids and hydraulic gun chargers. The guns have an effective range of about 1,000 yards.

A controller, which when stowed rests against the right side of the fuselage, regulates the chin turret movement. It is unlatched and swung to a convenient height before operation.

The sight, synchronized with the movements of the gun in azimuth and elevation, is driven by tachometer shafts from the azimuth and elevation gear trains. Thus the gunner's vision always takes in the direction in which the guns are pointing and moves with them. A rheostat controls the intensity of the light focused on the concentric circles projected on the sight glass. These circles and their center are employed like the ring sight and dot on a flexible gun installation. The gunner must estimate all incurred corrections after observing the projectory of tracer bullets. In order to permit flow to the guns while



The Fort now has a chin that stings.

the turret is in motion, ammunition is held in two metal containers fixed to the movable turret housing.

Another minor change in external appearance of the bomber is effected by the removal of the two B-17F pitot-static masts on each side of the nose and the installation of a single pitot mast just below the body centerline. Flush-mounted static fittings are placed on each side of the body just above the front edge of the forward entrance door. The radio compass loop has also been moved to a point just ahead of the bomb bay doors and slightly to the left of the body centerline.

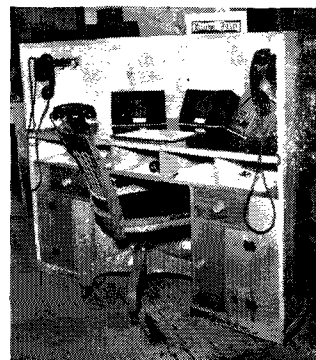
The navigator's compartment has been worked over and a larger table and a swivel chair installed. The gyro flux gate compass and radio compass have been rearranged and a shelf provided over the table. A step is added beneath the astro-dome to facilitate taking sights. Interphones, jack boxes and heated suit rheostats have been relocated.

An entirely new cable-operated bomb control system is a feature of the B-17G, eliminating the push-pull rod control and embodying a new bomb control handle assembly and a gear type coordinating unit. The three outstanding improvements and advantages gained are: (1) The bomb doors can be closed from the bombardier's station after the emergency release is pulled. (2) In addition to the mechanical interlock, the bomb door actuating switch handle is located so as to interfere with any attempt to move the internal bomb control handle to select without first opening the bomb doors. (3) The release of the external bombs can take place without affecting the internal racks or the bomb doors.

## Handy Flight Control Desk

Capt. Herbert Bernenko, base operations officer at Kellogg Field, Mich., has designed a functional desk in an effort to eliminate the usual disorder that comes from keeping flight control equipment on an ordinary table and to give the clerk privacy needed for his work. The desk was built by woodworkers at the base sub-depot.

It is semi-circular with a curved board rising from the outer edge to screen the clerk. The interphones are suspended from either end of the board and within easy reach. Maps and rules of procedure are affixed to the inside. Telephone, interphone speakers and teletalk equipment are aligned along the rim of the desk, with plenty of space left for log sheet and scratch pad.



Everything within reach.

Open compartments, built in directly under the desk top, and drawers and cupboards on the right and left provide handy space for storing equipment and forms. All wires run under the floor to the desk, giving the clerk free access to the status boards. — Public Relations Office, Kellogg Field.

## Self-Powered Airplane Starter

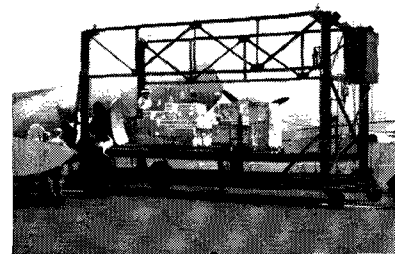
A portable self-powered generator unit built from obsolete spare parts, scrap iron and other salvage materials now is used to start most of the planes at Chanute Field, Ill., replacing the usual battery cart. The unit was designed and constructed by Tech. Sgt. Robert Mercer from an idea suggested by Maj. Howell G. Crank, post operations officer.

Power for the generator is supplied by a 2-cylinder, 13½-horsepower gas engine, originally designed for use as an auxiliary to generate electric current in obsolete planes. The entire unit is mounted on three wheels for easy movement. Connection to the plane is made by a thirty-foot insulated cable. Two two-gallon tanks supply engine fuel. Control panel instruments and controls include a fuel pressure and oil pressure gauge, ammeter, voltmeter, throttle, generator, and starting and ignition switches.

Generating 24 volts, the unit can be used on most types of military aircraft. — Public Relations Office, Chanute Field.

## Mobile Elevator for Loading Planes

A mobile elevator by which planes are loaded from a roller-conveyor is facilitating the handling of air cargo by the 39th Air Freight Wing Detachment at the Newark (N. J.) Army Air Base. It was developed by Capt. Julian A. Devereaux, CO of the detachment, Phillip A. Cosgriff, general superintendent, and the Mercer Engineering Co., New York City.



Handles five tons.

In use since mid-summer, the elevator is adjustable to heights from 12 to 22 feet, sufficient to accommodate the largest plane. It has a platform 8 by 22 feet, a 10,000-pound capacity, and is powered by a five-horsepower electric motor.

Also useful in loading and unloading operations at the air freight warehouses, the elevator is moved by regular small tow-tractors. — Capt. Arthur J. Lonergan, PRO. ☆





First Sergeant Cathey's squadron has been alerted, and like a mother hen protecting her brood from the approaching storm, the good sergeant is checking with the unit personnel office and the supply sergeant to bring up to date each man's service record, clothing record and forms 20, 81 and so forth.



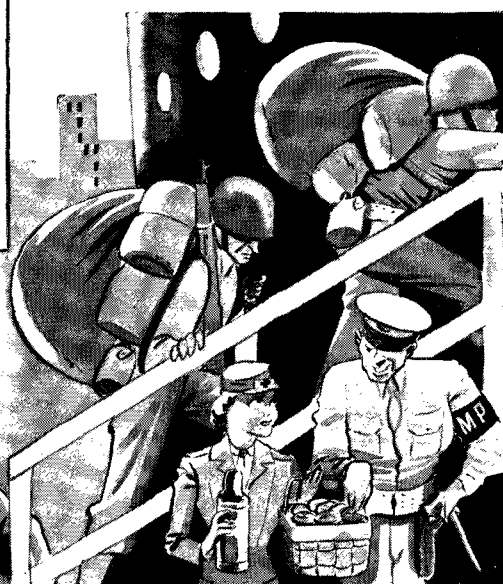
Corporal Newman is luxuriating to the fullest extent on his pre-overseas shipment furlough. He'll carry Sis' snapshot of this boudoir scene with him over there to buoy his spirits while sweating out a long chow line near a muddy field kitchen.

## OVERSEAS MOVEMENT

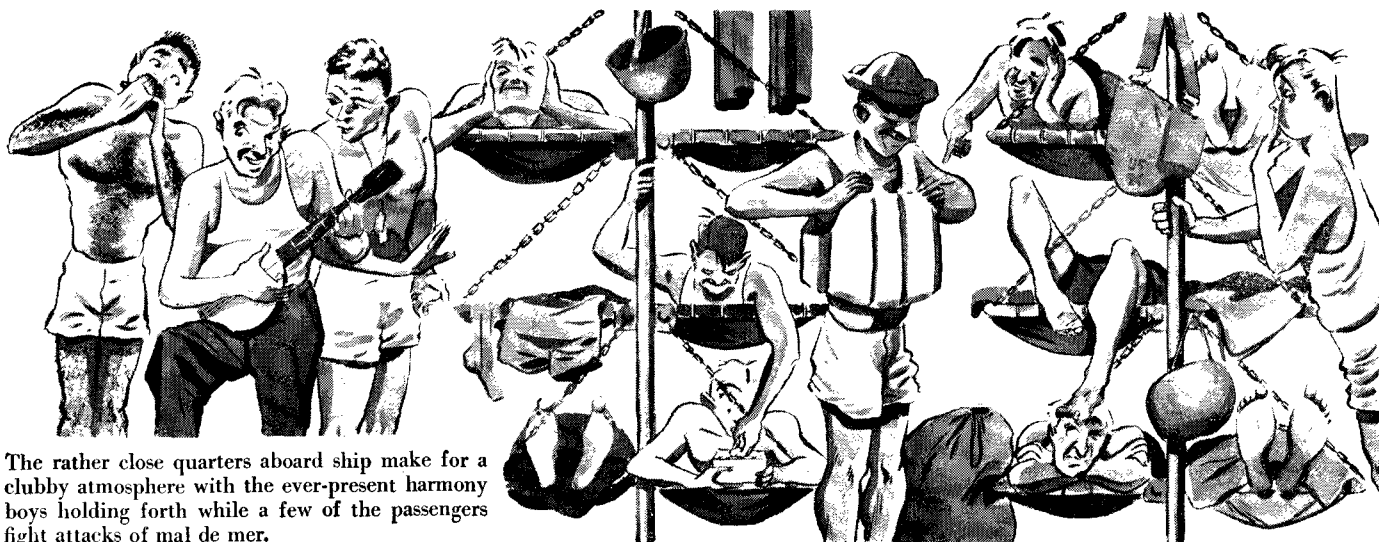
*By Lieut. Wm. T. Lent*



In today's Army a man is always being shot or shot at. Immunization records must be completed before the unit departs for the staging area. In this case, Tail Gunner Simpson is more afraid of the medic's stiletto than he will be of the heavy flak over Berlin next month.



The movement from the staging area to the port of embarkation is generally accomplished with unbelievable smoothness and accurate timing. Private Willoughby proves the exception to the rule when the knot on his "A" bag slips as he walks up the gangplank.



The rather close quarters aboard ship make for a clubby atmosphere with the ever-present harmony boys holding forth while a few of the passengers fight attacks of mal de mer.

# Wings for the Wounded

(Continued from Page 23)

Jenny—had been arranged to accommodate a special type of litter with patient.

Many improvements of plane No. 3131 were effected by enterprising flight surgeons and cooperating Air Corps officers during 1918 and 1919. During the years following the war, flight surgeons repeatedly urged the use of airplane ambulances by the armed services. Various planes were converted to carry one or two litter-type patients. Transportation of patients from airfields to general hospitals was encouraged throughout the Air Corps during this period, but, like many other developments within the armed services, there was much opposition to air evacuation as such.

At this time, the French again led in the development of the first airplane ambulance organization. A Major Epaulard in October, 1921, organized the first airplane ambulance squadron, consisting of six planes adapted to carry two or three litter patients. This unit saw duty during the French military operations of 1921 and 1922 in Morocco and the Levant. During the last six months of 1921, approximately 700 patients were evacuated by air. For comparison of figures only, it might be mentioned that during the month of August, 1943, a total of 927 patients were provided air evacuation along the ATC global routes. U. S. Marines in Nicaragua during the twenties found that air evacuation was not only the medical answer to the evacuation of wounded but also the best defense against ambush methods of the insurrectionists.

TODAY the organized air evacuation service of the Army Air Forces depends on cargo and transport planes—the C-46, C-47, C-54, C-75 and C-87—the same planes that carry equipment, medical supplies, gasoline, oil, food, jeeps, field artillery pieces, parachute troops and airborne troops to the forward areas. On their return from the fighting zones—whether within the theatres of operations or between the theatres and the States—these planes fly casualties to hospitals hundreds of miles from the din of the battle areas. A small number of O-49 planes, called the L-1A, have been converted to carry two litter patients for use at isolated stations. In certain island commands AAF task forces use PBV amphibian planes, but this is the exception rather than the rule.

The future of air evacuation, both for military and civilian requirements, is limited only by the type of equipment available. The helicopter and the pick-up glider are in the development stage. However, staff members of the Aero-Medical Laboratory at Wright Field, as well as many other flight surgeons in the medical service of the Air Forces, are continuing

research to effect constant improvements in air evacuation. Development of the present type of medical supplies, oxygen equipment and litter supports, now used throughout the air evacuation service, is the result of the combined efforts of the Aero-Medical Research Laboratory, the Troop Carrier Command, the AAF School of Air Evacuation and the School of Aviation Medicine.

The skill of American surgeons, the miracle of the new sulfa drugs and blood plasma are given a far better opportunity to effect their life-saving potentialities when the casualties are transported by air

in the most comfortable and rapid means possible. The low fatality rates of this war bespeak in themselves what these combined efforts of the medical service have accomplished.

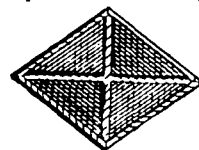
As to the morale value of air evacuation, the true answer can only be found in the patients who have endured the hardships of surface ambulances or hospital trains in the fighting zones, and have later been placed aboard an airplane to continue their trip to a hospital in the rear area. These patients are indeed the most enthusiastic advocates of air evacuation. ☆

## What's Your AIR FORCE I.Q.?

Take a look at the ceiling, then take off on this month's AIR FORCE Quiz. Chalk up five points for each correct answer. A score of 90 or above is (as usual) excellent; 80 to 90, on the runway; 70 to 80, not bad; 60, fair; below 60, well. . . . Answers on Page 56.

- Corsica is located**
  - Between Sardinia and Sicily
  - In the Adriatic
  - Off the west coast of Turkey
  - North of Sardinia
- The wingspread of the P-51 is approximately**
  - 43 feet
  - 31 feet
  - 37 feet
  - 28 feet
- If a pelorus is an instrument used by a navigator, Polaris is**
  - The North Star
  - An instrument used by a bombardier
  - An island in the Solomon group
  - The distance from the North pole to the South pole
- Headquarters, 6th Air Force is located in**
  - Hawaii
  - Alaska
  - Greenland
  - Panama
- "George" is the name sometimes given**
  - The P-51
  - The last plane in a bomber formation
  - The automatic pilot
  - A ground log
- Army paratroops are**
  - Members of a service branch of the AAF
  - Members of the Caterpillar Club
  - In the Ground and Service forces
  - Members of the Troop Carrier Command
- If WAC is the abbreviation for Women's Army Corps, for what does the abbreviation WAVES stand?**
- Ellington Field is located in**
  - Mississippi
  - Florida
  - Texas
  - Illinois
- AAF planes have dropped bombs in combat with delayed-action fuzes set for as high as one hour.**
  - True
  - False
- Don't look now. What are the colors in the AAF shoulder patch?**

- The grade in the Navy equivalent to the Army staff sergeant is**
  - 2nd Class Petty Officer
  - Seaman First Class
  - 3rd Class Petty Officer
  - Seaman Second Class
- The horsepower developed by each engine of the B-17 is**
  - 900
  - 1,500
  - 1,200
  - 2,000
- The official song of the Army Air Corps was written by**
  - Irving Berlin
  - Robert Crawford
  - Maj. Gen. James Doolittle
  - George M. Cohan
- A chaplain with the rank of major can properly be addressed as either Major Jones or Chaplain Jones.**
  - True
  - False
- Bomber crews with the 8th Air Force usually are grounded after**
  - 20 missions
  - 30 missions
  - 25 missions
  - 35 missions
- "Towing the sleeve" refers to**
  - Pulling a target for aerial gunnery
  - Coming out of the barracks half dressed
  - Flying back with one engine gone
  - A transport plane with a glider attached
- Identify this collar insignia:**



- The sump is**
  - Part of an engine crankcase serving as a reservoir for lubricating oil
  - Excess pressure at the bottom of a gas cell over the outside atmospheric pressure
  - A positive-displacement reciprocating pump
  - A Southerner's way of saying the sun has risen
- Latitude indicates distance from the equator**
  - North or south
  - East or west
  - North or east
  - South or east
- Only one of the planes listed below has twin engines and twin tails:**
  - Beaufighter
  - ME-110
  - Hurricane
  - ME-109

# THIS IS YOUR ENEMY

## ...IT'S YOUR LIFE OR HIS!



Illustrated by Lieut. William T. Lent

**THE** Germans recently have increased their use of smoke screens as a measure of protection against the increasing fury of Allied air raids. Occasionally an entire area is blanketed with smoke, and at other times a ground haze is created to distort objects seen through it and thus become as effective as the full screen.

The screen is not actually smoke but a suspension in air of tiny, liquid particles sprayed by generators built on somewhat the same principle as a Flit gun. Weather, of course, affects the density of the screen. The best sort of a day for the Germans—and a bad one for us—is a highly humid day with little or no wind.

The Germans have increased the volume of the smoke by increasing the number of generators in a single locality. A year ago only ten or twelve generators would be operated in one place; now as many as 350 are used. The Germans are using barges as bases from which to operate the generators used in protecting ports. Perhaps the Nazis are at least making some use of the barges with which they intended to invade Britain.

An unusual characteristic is that the screen tends to thin out as the target is struck by successive waves of bombers. Best explanation is that the percussions of the bomb explosions aid the natural dispersion of the screen.

**APPRAISAL OF THE JAP.** An S-2 officer from the South Pacific appraises the Jap in these words:

"The Jap racial characteristic of cunning is one that should be considered in definite distinction to intellectual strategy or thoughtful tactical deception. It is an innate quality, almost instinctive, a quality to be remembered because, like the small animals of the forest who can outwit their larger adversaries, the Jap is capable of inflicting damage and confusion upon him whose alertness lags, on him whom complacency has so far disarmed. However, in all contacts with him, by no means the superman of early nightmares, we shall continue to find that we have a persistent, industrious, audacious and diligent enemy; often unimaginative, but conditioned to hardships and scornful of suffering; an enemy whose conceivable advantage and definite 'capability' is his mental attitude and complete resignation to war. A fighter whose conception that his own civilization is spiritual, while contemptuously charging his opponents with materialism, carries into the fray a crusader spirit that is an enviable weapon in anyone's hands."

**FAKE CITIES.** The Germans repeatedly have built fake cities to lure our pilots away from Berlin. A forest outside Berlin

was cut through with lanes so at night it might look like the Tiergarten Park. Then fake roofs of cloth and paper were placed in the area, and at night low lights were illuminated to make the location appear as a blacked-out city.

In their efforts to camouflage landmarks in another city, the Nazis drained a small lake near the harbor and built imitation houses on the lake bed. A wooden bridge was constructed to look like a noted bridge which, in turn, was disguised to resemble a boulevard complete to a replica of the town's most famous cafe.

It is reported that a large railway station, complete in every detail, was erected in a large field at another location. Very realistic, it even included dim, colored lights which at night looked like signal boxes. After raids, fires were lit to deceive airmen even further.

The Rumanians built a fake town near the Ploesti oil fields, equipping it to appear moderately lighted at night. It was the same size as the town of Ploesti and four miles away—in the opposite direction from the oil fields, of course.

**RADIO PHONY.** The pilot of a P-400 (Australian P-39) was on patrol when a message advised his flight of a change in the vector of the mission. The flight altered its course. But a smart controller at home

**AIR FORCE, December, 1943**

base had also heard the message which had been slipped in on the correct frequency by the Japs. He then checked the flight back to correct the trap the Japs had set. Now all controllers and flight or squadron leaders maintain frequent contact to prevent the Japs from vectoring our planes off course.

**PEP TALK.** An order of the day which Reichsmarshal Goering issued to German Air Force units in the Mediterranean area was captured recently. "Together with the fighter pilots in France, Norway and Russia, I can only regard you with contempt," Goering told his men. "I want an immediate improvement and expect that all pilots will show an improvement in fighting spirit. If this improvement is not forthcoming, flying personnel from the Kommodore downwards must expect to be reduced to the ranks and transferred to the Eastern Front to serve on the ground."

**GERMAN RECOGNITION SIGNALS.** The Nazis have used cloth strips, flags, felled trees and smoke candles as ground force recognition signals to their aircraft. Now and then, when lines were changing rapidly, the ground troops have been disciplined for forgetting to remove the cloth strips used to indicate a bomb line. These mistakes have been less frequent recently, inasmuch as company commanders are now held personally responsible for the cloth.

For a while, the Nazis used swastika flags to indicate their units, but they proved difficult to recognize from the air. Smoke candles are gaining more widespread use. In some instances groups of men, in danger of being attacked by one

of their own planes, have been known to form a swastika on the ground and wave their handkerchiefs. At night these groups wave flashlights or torches.

Enemy airplanes have been known to signal ground troops with Very pistols, flares, rockets and smoke shells. The smoke shells have been used frequently to indicate Allied positions, tanks, artillery batteries or movements. German pilots, spotting an artillery battery have dropped blue smoke bombs over it so that their ground troops could observe its general location.

The Germans also have used an interesting flare system in some of their night bombing flights. A "pathfinder" would go ahead of the attacking planes to spot the target and drop a colored flare when he thought he had found the right place. Then another plane would drop illuminating flares, and the pathfinder would circle to make certain he was right. He would then signal the bombing planes to come in and unload.

**DRAW A GOOD BEAD.** A top turret gunner, with a record of 45 missions over Europe and Africa, makes this observation about German fighter tactics: "The Germans these days are not concerned with precision shooting against any one particular bomber. This lesson was learned the hard way. At first the Nazi came in fast and straight, and usually level at the tail. Their gunnery was deadly, but the Allied tail gunners were too good for that approach. The Nazi tactics changed rapidly, and our gunners were faced with the difficult target of speeding, rolling ME-109s. They'd come in from the back, with all guns of the six or more Messerschmitts shooting at the group of bombers.

"What can we do about that? Nothing except shoot straighter, faster and more accurately."

#### LEFT, RIGHT, LEFT.

At one time a favorite Nazi tactic in trying to break up formations of P-38s escorting bombers was to bring six or seven FW-190s directly over the P-38 formation from the rear and then split, four or more turning left and the remainder right. The fighters going left would attack the P-38 formation, and when the P-38s broke left, the enemy fighters on the right would move in on the exposed bomber flight. The

P-38 commander retaliated by calling up his reserve flight, telling its pilots to break right, while the other flights went after the enemy on the left.

**TIN CANS AND VALISES.** Food tins have been left around by the retreating enemy for some Allied soldier to pick up or kick. Many of these tins are packed with explosives to kill everyone within a range of several feet. The Germans also "plant" carrying cases as mines, leaving them where curious troops are likely to pick them up for casual inspection or as souvenirs. They are usually charged with TNT and filled with nails, bolts, nuts and odd pieces of iron.

**UNDER THE SPREADING COCONUT.** A striking example of Japanese sleight-of-hand and audacity has been reported by an S-2 officer with a heavy bombardment group in the Solomons. "In November, 1942, the Japs built a new landing field right under our very noses," he said. "This field on Munda Point gave the Japs very great potentialities and their presence was barely discernible at first.

"Always crafty in the use of camouflage, the Japs took full advantage of the webbing of coconut palms that lay like a giant net over much of their activity. The absence of day workers, trucking and other signs of construction was later explained by night reconnaissance which revealed the field literally crawling with workers — everything proceeding with startling animation under artificial illumination."

**SHAKESPEAREAN STUFF.** Theatrical producers in Shakespeare's time used to save on the budget by marching some men across the stage, behind the backdrop, and across the stage again, giving the effect of a huge army. The Germans tried to work the same trick one recent night by moving trucks and tank units back and forth just behind the lines, trying to make things look as if they were getting reinforcements. When they retreated the next day, they left behind numerous dummy trucks made of cardboard.

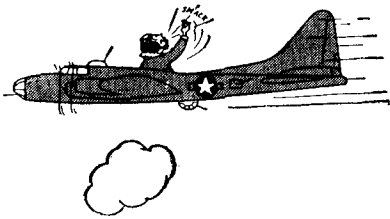
**THE NEXT OUTFIT.** During the Tunisian campaign, an anti-aircraft unit dug into a position on a hill. That night at dusk, some engineers in British and French uniforms came into the vicinity and started digging gun pits to the rear of the AA guns, while the AA crew watched with some interest. The next morning, the engineering units with their guns placed turned them on the AA unit and drove it out, taking over the abandoned equipment. The "French" and "British" were Germans. Moral: NEVER TRUST ANY-ONE YOU DO NOT KNOW—ALL UNKNOWN PERSONS, WHATEVER THEIR UNIFORMS, ARE TO BE SUSPECTED. ☆



# OUR DEVELOPMENTS IN FIREPOWER

(Continued from page 18)

## LIGHTNINGS IN THE SKY



Written by a Radio Operator-Gunner on  
a B-17 in the African Theatre

Oh, Hedy Lamarr is a beautiful gal  
And Madeline Carroll is, too;  
But you'll find, if you query, a  
different theory  
Amongst any bomber crew.  
For the loveliest thing of which one  
could sing  
(This side of the Heavenly Gates)  
Is no blonde or brunette of the  
Hollywood set,  
But an escort of P-38s.

Yes, in days that have passed, when  
the tables were massed  
With glasses of Scotch or champagne,  
It's quite true that the sight was a  
thing to delight  
Us, intent upon feeling no pain.  
But, no longer the same, nowadays  
in this game,  
When we head north from Messina  
Straits,  
Take the sparkling wine—every time  
just make mine  
An escort of P-38s.

Byron, Shelley and Keats ran a dozen  
dead heats  
Describing the view from the hills,  
Of the valleys in May when the winds  
gently sway,  
An army of bright daffodils.  
Take the daffodils, Byron; the wild  
flowers, Shelley;  
Yours is the myrtle, friend Keats.  
Just reserve me those cuties,  
American Beauties,  
An escort of P-38s.

Sure, we're braver than hell; on the  
ground, all is swell—  
In the air it's a different story.  
We sweat out our track through the  
fighters and flak;  
We're willing to split up the glory.  
Well, they wouldn't reject us, so  
Heaven protect us,  
And, until all this shooting abates,  
Give us courage to fight 'em—and  
one other small item—  
An escort of P-38s.

to design, perfect and install these turrets in mock-ups long before the big plane took to the sky. Thus, contrary to popular belief, American designers were studying the effectiveness of mechanically controlled turrets some time before the war.

Types of armament are determined by the tactical use to be made of the airplane. For instance, in the case of a night fighter where the normal technique requires approach on the target from a certain direction, the fire control equipment must be so designed that the maximum firepower can be obtained in that direction. The sight operator's position must be located to permit maximum visibility in scanning and sighting. In the case of the night fighter, development of a sight that allows greater passage of light through the optical system may be required.

One night fighter developmental design has a multiple-gun turret. For several months in our laboratory we tested the turrets in special mock-ups before the completed airplane was brought to Wright Field. The plane's upper turret fairly

bristles with guns, resembling an infantry pill box.

In the past, the main function of the armament laboratory was to develop new aircraft armament items. In addition to this development work, much of the effort of this laboratory—and of the Engineering Division—is directed toward the modification of combat equipment to replace one type of standard equipment with another type, depending on the tactical use of the aircraft. Other developments engineered by the armament laboratory may not be for specific application, but for insurance against the day they are needed. Some of our newest gadgets are put on the shelf to await the time when they can be used most effectively.

Up to the present time, armament for fighter aircraft has varied only in caliber of guns. However, with the stepped-up tempo of enemy fighter activity, the requirement for a fixed gun installation that will provide automatic corrections for lead, range, altitudes and speeds is becoming more apparent. This subject now is being investigated and development articles are being tested to ascertain their suitability. A great amount of development work also is being accomplished on new improved types of fighter gunsights. These include sights for night fighting purposes, extension of present sighting ranges, combination gunsights and dive bombsights.

That the firepower job is being well done is evidenced by the tallies which our airmen are scoring in combat against the enemy, by the number of Jap and German planes falling in combat, and the ever-increasing pounding of enemy cities by our big bombing planes.

Literally, we are designing guns and putting wings on them. ☆

## MISTAKES IN 'ON THE LINE' PICTURE ON PAGE 40

(READING FROM LEFT TO RIGHT)

1. Get your foot off the crank handle, Corporal! It's no foot rest. The engine is apt to turn over if inertia is engaged. Incidentally, that crank shouldn't be there. Also, move your left foot off the coolant hose. Reference: Common sense and TO 04-5-12.

2. It's feet first in this picture, but they're in the wrong place. You there, removing the electrical connection on the magneto. Don't stand on the cowl former because your weight will break the part, the cowl won't fit and the former will have to be replaced. Reference: Good shop practice.

3. That screwdriver stuck in the manifold foreshadows a great hazard. If it falls down between the "V" of the engine, and stays there, you can't tell what might happen.

4. Ouch! Dual boner from you seated on the maintenance stand. First, take your foot off that piece of cowl. You'll mash it so it won't fit. Secondly, nix on using that long extension handle to install spark plugs. It will cause pulled or stripped spark plug bushings. Use the proper torque wrench and refer to TO 03-5E-1.

5. Now, Corporal, you know better than to take the prestone coolant cap off with a screwdriver and hammer! A strap wrench is used. Reference: TO 01-75FB-2. And your left foot—keep it off the prop shaft or you'll damage the splines. Reference: Good old horse sense.

6. And say, come to think of it, are you the famous man from the flying trapeze? We're wondering just how you landed there anyway, which gets us around to the boner of the crew chief stand not being under the prop shaft.

## Answers to Quiz on Page 53

1. (d) North of Sardinia.
2. (c) Approximately 37 feet.
3. (a) The North Star.
4. (d) Panama.
5. (c) The automatic pilot.
6. (c) Ground and Service forces.
7. Women Appointed for Volunteer Emergency Service.
8. (c) Texas.
9. (a) True. For example, in the August attack on the Ploesti oil refineries.
10. Gold, Blue, Red and White.
11. (a) 2nd Class Petty Officer.
12. (c) 1,200.
13. (b) Robert Crawford.
14. (a) True.
15. (c) 25 missions.
16. (a) Pulling a target for aerial gunnery.
17. Finance Department.
18. (a) Part of an engine crankcase serving as a reservoir for lubricating oil.
19. (a) North or south.
20. (b) ME-110.



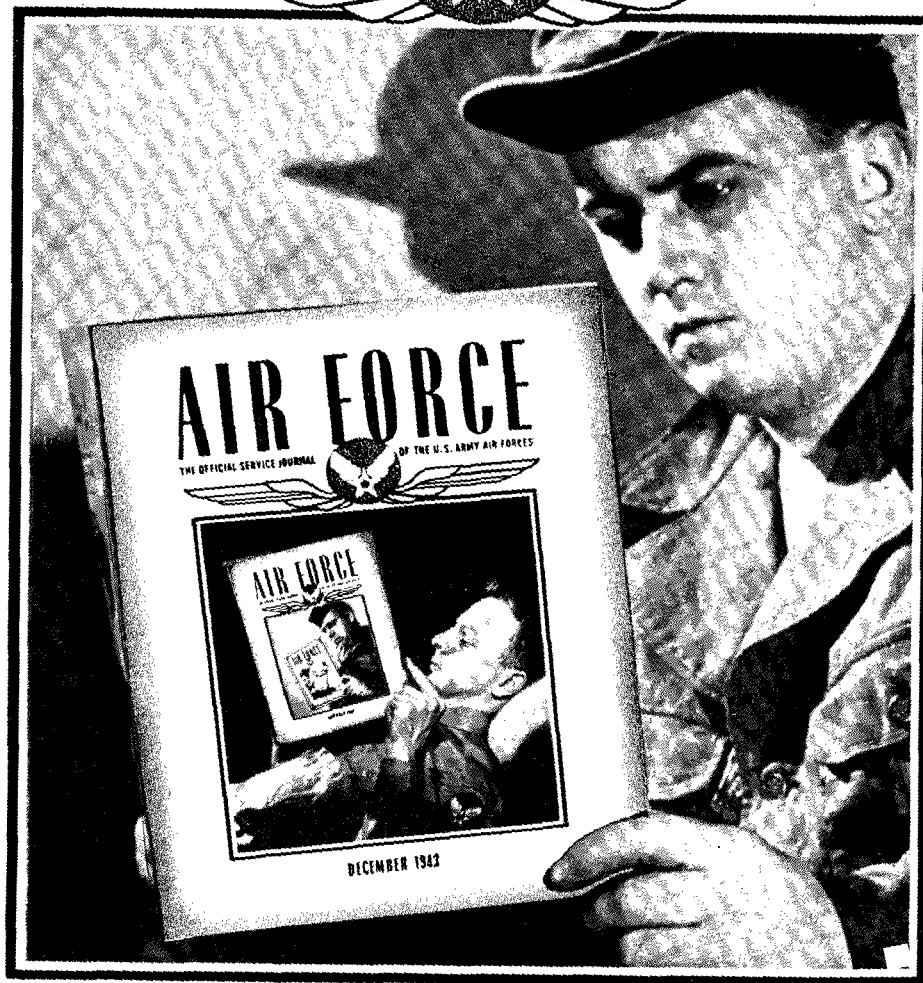


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